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No. 5
VOL. XXIV

180 N. Michigan Ave.
Chicago, U. S. A.

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor

Horn development in rams is due to the action of an internal testicular secretion. If rams are castrated in early life, horn development is arrested.

Antimony salts interfere with reproduction, particularly in the female. These salts were used in treating Kala Azar and it was noted that reproduction was seriously interfered with in treated cases. Antimony salts may interfere with conception, produce abortion and damage the fetus.

Rachitis of chicks up to 10 weeks of age may be due to the filtration of the antirachitic rays of sunlight that has passed through ordinary-window glass. Rickets due to this cause can be obviated by substituting "celo-glass," for the ordinary window glass.

Liverflukes in sheep can be controlled according to Hall, Chief of the Zoological Division of the Bureau of Animal Industry, by the following procedure:

1. Medication of sheep with 1 cc doses of carbon tetrachlorid, repeating the dose when necessary.
2. Snail destruction on pastures with copper sulphate.
3. Draining stagnant pools, swamps and marshes in so far as possible.

It is advisable to provide a diet containing ample quantities of calcium for a week before treating.

"Experimentally blacktongue in dogs is due to a dietary deficiency which is capable of being corrected by something contained in yeast." Heat destroys or inactivates the blacktongue preventive in yeast.—*Public Health Service.*

Cysticercus ecchinococcus is said to infest practically every ruminant in Morocco. The dog and the jackal are the usual hosts of the adult parasite.—Robert in *Jour. of Trop. Med.* Vol. 16, No. 3.

The Tuberculosis death rate in the human reached a new low level in 1928, according to the Metropolitan Life Insurance Company. The death rate from tuberculosis in 1928 was 72.1 per 100,000.

Success in swine production is dependent upon:

1. Healthy prolific sows that give ample quantities of milk.
2. A healthy vigorous boar (preferably pure-bred) of the proper type.
3. Proper ration for brood sow.
4. Comfortable shelter with proper ventilation.
5. Providing lots in order that the sow will obtain exercise.
6. All surroundings being kept in a sanitary condition.
7. Proper care and management at farrowing time.

That angora goats are of value is evidenced by the fact that the directors of the Angora Goat Association are offering a reward of $300.00 for the conviction of any goat thief.

Simple anemia of young animals can be prevented according to Hart of the University of Wisconsin, by the presence of minute quantities of copper in the diet. Milk contains no copper, or at least insufficient copper prevent the development of anemia in young pigs.

According to de Area Teco, a specific intradermal reaction occurs in actinomycotic infected animals when products of actinomyces cultures are injected into the skin. This reaction will be of considerable value in the diagnosis of cases in which the infection occurs in internal organs.—*Exp. Station Record.*

Cysticercus bovis was found in 7521 of the 1,030,795 cattle slaughtered in the Johannesburg Abattoir, South Africa, from 1911 to 1922 inclusive, and in 1134 out of 139,899 cattle slaughtered at the Pretoria Abattoir, South Africa during 1914 to 1922. The *Cysticercus cellulosae* infests about 10% of swine slaughtered at the same abattoirs.—*Reprint No. 5, Union of South Africa.*

The rat is an expensive pest. It has been estimated that there are as many rats in the United States are there are humans. The cost of maintaining rats in the United States is approximately $600,000.00 daily for what they eat and there is an additional enormous expense for the destruction of buildings, etc. The rat should be eradicated.

Wool covering on face, ears and legs is frequently discussed by sheep breeders. Generally speaking, wool that grows on the extremities (face, ears and legs) is relatively coarse and has little sale value. Therefore the breeding of sheep that has the extremities well wooled is done more as a fad or fancy than for economic reasons. —*N. Hamp. Tec. Bul. 37.*

The exact cause of epilepsy is not known, however, Morgan of the University of Illinois produced epilepsy in a dog by a brain operation.—*Science.*

That carbon tetrachlorid is efficient in eliminating hook worms has been amply proved. Many small animal specialists use this agent exclusively for this purpose. Certain contra-indications must be taken into consideration in the use of carbon tetrachlorid, otherwise serious results may occur. Thus, ascariasis and calcium deficiency are conditions in which carbon tetrachlorid should not be used.

Tests with sprouted oats as a means of correcting or improving temporary sterility in cows and heifers were continued throughout the year with favorable results. Feeding 5 pounds of dry oats a day, in the sprouted form, was effective in the case of six cows and ten heifers during the year, making a total of 14 cows and 19 heifers effectively treated since sprouted-oats-feeding experiments were begun.—L. A. Rogers, in Report of the Bureau of Dairy Industry, U. S. Dept. of Agriculture.

The purpose of disinfection is to destroy lurking sources of disease, but inasmuch as harmful bacteria and parasites are often sheltered by refuse and accumulations of litter and manure, it is wasteful of disinfectants to attempt the job before the building is thoroughly cleaned. Surfaces such as ceilings, walls, partitions, floors, and built-in equipment should be swept until free from cobwebs and dust. Any accumulation of filth should be removed by scraping and scrubbing, using for this purpose a wire brush or other stiff brush and warm water with a liberal quantity of washing soda. If woodwork has become decayed it should be removed, burned, and replaced with new material. All refuse from stable and barnyard should be removed to a place inaccessible to livestock and burned if possible; otherwise mix with a solution of chloride of lime in the proportion of 6 ounces to 1 gallon of water.—Geo. W. Pope.

Live Stock Require Iodin in the Ration

By GEORGE H. CONN, Freeport, Illinois

IODIN is one of the necessary nutritional elements for live stock. This is particularly true for live stock produced in those sections of the United States and Canada which are known as goitre districts. Such districts are apparently poor or deficient in iodin, in both the feed and water they supply for live stock.

It has been frequently observed that pigs born in the early spring months of March and April, are subject to hairlessness, and goitre or bigneck more frequently than those pigs born later in the spring, as May and June. It has been further observed that even though spring litters in a community or district may be quite badly affected with these conditions, that the litter born in the fall months are not so commonly affected. In fact many fall litters or other young born in the fall of the year, do not show any evidence at all of these conditions which are now known to be caused by a deficiency of iodin in the feed or drinking water.

The Iodin Content of the Thyroid Gland Varies

From observation and testing the thyroid glands which are collected at the large packing houses throughout the year, for the purpose of manufacturing desiccated or dried thyroid glands for the treatment of goitre or big neck, it has been found that there is a seasonable variation in the iodin content of the thyroid gland.

From a number of tests made from these collected glands it was found that the iodin content of the thyroid glands was highest in the fall of the year after the animals had been on pasture and green feed for several months. The iodin content of the thyroid glands which are collected from animals that have been on dry feed for several weeks is very low. It is evident from this that domestic animals largely regain the iodin element which they need in nutrition during the summer months while on pasture. The iodin content of the thyroid gland in pigs is frequently up to four times as much in late summer or early fall as it is during late March or early April.

Iodin Content of Plants is Variable

It has been demonstrated that the iodin content of various plants or feeds will vary considerably in the percentage of iodin they carry. This variation is the result of variation in the amount of iodin found in the soil and water where the crops are grown. The iodin content of feeds grown under similar soil and weather conditions is not always the same. Some investigators look upon iodin as an accidental element when found in some materials and for this reason must be supplied artificially. Such investigators do not feel that it is advisable to trust to nature to supply sufficient iodin for the animal's needs.

From a large number of analysis made of common feeding stuffs, it is evident that one should not depend upon ordinary feeding materials to supply iodin in sufficient amounts.

The Hairless Pig Disease

Hairless pig disease has been a common cause of extensive losses in young pigs in many sections of the northern half of the United States and Canada. This can be accounted for in no other way than through a deficiency of iodin in the sow's feed during pregnancy. This deficiency of iodin prevents the proper development of the young, with the result that they are often born dead and without hair or are extremely weak and listless and die soon after birth.

The thyroid glands in pigs suffering from this disease are several times as large as the glands that are found in normal pigs, but even with the great enlargement they do not contain larger amounts of iodin. The larger the thyroid gland, the less iodin it contains. This enlargement is an effort on the part of nature to provide more gland material for the deposit of iodin in the gland.

This condition is very prevalent in Montana and other northwestern states, and is frequently found in middle western states, such as Wisconsin, Minnesota, Iowa, and Illinois. That this condition may be more prevalent than the ordinary person would believe is quite likely, due to the fact that in most sections of the United States and Canada, there are certain seasons when a great number of live stock are born weak and unthrifty and soon die.

Sows Receiving Iodin Do Not Have Hairless Pigs

It has been found that, through the use of some form of iodin in the mother's feed, that this condition can be prevented. Where the young are frequently born with big neck or goitre, or are weak and unthrifty and die soon after birth, it is necessary to supply iodin in order to produce strong, vigorous young. In many sections of the northwest, also in many sections of the corn belt, it is now a common practice to supply iodin in some form to breeding females, especially during the summer months.

Potassium Iodid Most Commonly Used

Considerable experimental work has been done with potassium iodid as a source of iodin, for preventing these conditions, but no exact dosage has been determined. From experiment work done with humans, it is apparent that a very small amount of this element is needed. In experiments total amounts as low as 30 grains throughout the gestation period for mature sows have been found sufficient for the prevention of goitre or big neck in their young. This provides for one-fourth grain of potassium iodid per day, but it is possible, and the present evidence indicates that a much smaller dose than this would be sufficient.

Some investigators are of the opinion that as little as one-tenth grain per day is sufficient to prevent this condition in brood sows, but this small amount should be given throughout the entire gestation period. Some experimental data has been found that where iodin is given in somewhat larger amounts than this for a short period that in most instances it will prevent these conditions.

The most general method of supplying iodin to pregnant females is the use of small doses throughout the entire period. The results have been so satisfactory through the use of this material as a preventative for this condition that most producers of live stock in these regions consider it an essential factor in the successful production of live stock.

Iodin is required in such small amounts that the cost is not the determining factor in its use, but the labor and difficulty of administering it. For that reason progressive farmers and breeders desire iodin for use with live stock in some form that is easily administered.

Weak and Unthrifty New Born Animals

Where live stock are born occasionally that are weak and listless and they also show suggestions of not sufficient vitality to stand upon their feet, it would be well to suspect a derangement of the thyroid gland very similar to goitre or bigneck.

The fact should be kept in mind that a deficiency of iodin in the mother's ration may have brought about this condition, and that it would be well to include this element in all feeds that were given in the future to breeding stock.

Many of our leading authorities at this time are of the opinion that this condition is caused by an iodin deficiency. With calves and colts, as with pigs, no noticeable disease condition can be observed. They appear normal in every particular, the only thing not being normal is the fact that the animals cannot stand upon their feet and take no interest in anything going on about them. In

other ways they appear normal. Such animals usually die within 24 hours.

Even though the thyroid gland does not show enlargement, it is not an indication that there is not a deficiency of iodin. The fact should be kept in mind that this condition only shows enlargement of this gland in the advanced stages of the disease. Therefore, the deficiency may be serious enough to cause weak, unthrifty young, and yet not show an enlargement of the gland.

Goitre in Live Stock is Widespread

The entire northern half of the United States and the southern half of Canada are located in the goitre region. Weak and unthrifty live stock are produced in practically every section of the United States. Therefore, it is apparent that it is good business to supply iodin to all breeding live stock, since it can be done at such a small cost. In addition to the prevention of these conditions we have discussed, iodin has another value in that it increases gains and enables the animal to make more efficient use of the food consumed.

The Iowa Experiment station has carried on a series of experiments for several years to determine the effect of adding a small amount of iodin to the feed of apparently healthy swine. As far as the records show there has never been any goitre or big neck or hairlessness in the swine herd at the Iowa Experimental Station. Therefore it is reasonable to suppose that this swine herd has not been affected with this condition.

Iodin in the Ration Saves Feed

Two lots of pigs of the same weight, breeding and age, were fed exactly alike with the exception that one lot received one-tenth of a pound of potassium iodid with each 1,000 lbs. of supplementary grain, which was fed with the corn. The lot that did not receive potassium iodid required 440 lbs. of feed to make 100 lbs. of gain, while the lot that received iodin required only 385 lbs. of feed to make 100 lbs. of gain. In this feeding test the iodin saved 55 lbs. of feed per each 100 lbs. of gain, live weight.

In 1921 a second experiment was conducted under practically the same conditions and the lot receiving iodin in their feed made considerably better gains with less feed than those that did not receive iodin. The lot receiving iodin in the feed required only 385 lbs. of feed to make 100 lbs. of gain, while the lot that did not receive iodin in the feed required 425 lbs. of feed to make 100 lbs. of gain.

In 1923 and 1924 a third experiment was conducted under practically the same conditions. This experiment shows like the two previous ones that the use of iodin in the form of potassium iodid increased the gains and lessened the amount of feed required.

Summarizing these three experiments we find that where potassium iodid was fed, the average daily gain was 13% greater, and the pigs required 8% less feed. All three experiments showed practically the same result. Therefore, we reach the following conclusions concerning advisability of supplying iodin to swine in regions where there is apparently no goitre or big neck. The facts as herein set forth concerning swine are just as adaptable to cattle, horses and sheep.

Potassium iodid can be supplied to brood sows, ewes and bred cows as follows: Dissolve one ounce of potassium iodid in one gallon of water. A large glass bottle is satisfactory for this. Then three times each week add one tablespoonful of this solution to the slop for each 5 or 6 sows or for the same number of ewes. For each three cows add one tablespoonful to the drinking water. This may be placed in the watering trough if they are watered from a trough, or it may be sprinkled over the feed. It may also be sprinkled over salt and given to the cows. If salt containing iodin can be procured it should be used.

Recovery from Chronic Eczema After Treatment with Neosalvarsan*

By Staff Veterinarian, DR. MEYER

DURING August 1928 a landowner brought for examination a well-fed and well-cared for bay gelding, 12 years old. For about one year the animal had been aflicted with a chronic form of eczema, involving the left foreleg, the chest and scapular region. During all this time it had been treated, without success.

Examination showed that the skin of the left foreleg, down to the middle of the cannon bone, as well as the left side, from the withers to the elbow, was severely involved. Near the latter articulation the disease area formed a band four to six inches wide. On this part the skin was thickened, nearly devoid of hair and showed confluent plaques of peculiarly formed scales, whitish to yellow gray in color. The skin over the left fore arm and below the carpal region was similarly affected. Over the tendons the few remaining hairs were erect, the surface of the thickened skin was glossy (shiny) and covered with isolated scales and crusts, under which a pus-like exudate was found. Phlegmonous inflammation of the skin surround these areas. The skin covering the fetlock was markedly thickened, sensitive to pressure; the median side of the articulation was hairless, denuded of the epidermal layer and appeared oozing and moist. From the fetlock to the coronary band there was only slight loss of hair and slight induration, without other complications.

Careful examination of the entire animal shows a few nodules, in the region of the external angle of the ilium on the left side. The condition has never caused itching; it caused, on the other slight periodic lameness. This was probably due to the tense skin.

The owner stated that treatment had consisted in the application of different salves and lotions. Further information could not be obtained. We made the remark that the condition was probably caused by the application of strongly irritating remedies. This was denied. The owner said that the affliction began in the region of the fetlock from unknown causes, and that wounds had never been observed on the affected leg. The disease began to develop near the fetlock, it spread gradually over the forearm and over the side of the chest.

Our treatment began with a thorough application of vaseline to the affected parts, so as to soften the crusts and scabs. After carefully cleaning the lesions they were thoroughly treated with a 10 per cent solution of tar in alcohol, every second or third day. This treatment appeared to cause improvement in some places, while on parts that had previously been affected, new nodules and pustules appeared. The treatment was therefore continued by the thorough application to recently involved parts, of a salve composed of sulfur (15 parts), oxide of zinc (five parts), perugen (5), and vaseline (150 parts). Fowlers solution was also prescribed. Easily digested rations were given (a great deal of green feed). Whenever possible, the horse was kept out doors, in order to expose the lesions to the rays of the sun. This treatment was carried out for 8 weeks, without obtaining satisfactory results. The owner urged further treatment, being very anxious to save the animal.

We tried non-specific stimulating therapeutic intramuscular injections of Yatren-Casein. 5-7-10-8 cc of Yatren-Casein were injected every five days. Result: Marked reaction: swelling of the skin over the affected and surrounding regions, increased sensitiveness as well as increased temperature thereof, but no effect on the eczematous disturbance, which continued in the form of

* *Zeitschrift fur Veterinarkunde*, 1928, No. 4, Page 138-140. Translated by C. H. Schultz.

a papulo-vesicular, or pustulous and squamous eczema.

At the urgent request of the owner, and after considerable study of collateral literature, we eventually agreed to make a final attempt to cure the animal. In Froehner and Zwick's Special Pathology and Therapy we found a report that Matthies cured a stubborn case of eczema by injections of Salvarsan. We decided to give this method a trial.

The gelding was given an intravenous injection of 3 gm. (45 grains) of Neosalvarsan in normal salt solution. No marked changes were observed after the injection. External applications to the diseased parts were discontinued,—as was done in Matthies' case. On the day following the injection the entire left foreleg, up to the elbow was covered by a diffuse swelling. The swollen part was not painful however, and was not warm. The horse was somewhat lame when trotting. No change in the behavior of the animal could be detected. After a few days the swelling disappeared entirely, at the same time the crusts and scabs dried up. The skin became smooth and clean; no new focci developed. The tendons again became neatly visible under the softer and more elastic skin on the lower leg. Four weeks after the treatment hair began to appear over the entire afflicted region. Today, four months after the last treatment, the coat of hair is smooth and glossy. No evidence of the disease can be found on the skin.

We found another article, by Rips, who discussed a similar case. He cured a peculiar skin disturbance, affecting the region of the saddle, which resisted all internal (arsenical) as well as all external medication, by three injections, each of 4 gm. (60 grains) of Salvarsan. In this case it was a dermatitis apostomatosa, followed by excessive granulations which were about the size of a five-cent piece.

Considering the favorable results obtained in the cases mentioned, it becomes evident that we have in Salvarsan, or Neosalvarsan, a remedy that may produce satisfactory results in the treatment of stubborn eczemas which cannot be treated successfully with the usual remedies.

FRACTIONAL INJECTIONS OF HETEROLOGOUS SERUM FAIL TO PREVENT ANAPHYLACTIC SHOCK[1]

Greek veterinarians had to inject about 20 milk cows with anti-anthrax serum because the disease broke out in a dairy herd. Each animal had previously received a subcutaneous injection of 25 to 30 cc. of heterologous anti-anthrax serum (horse serum).

Six months after the second injections, a new outbreak of anthrax in the same stable compelled the veterinarians to repeat their serum injections and to resort to a triple anti-anthrax vaccination. These third injections consisted of double the amount of serum given at the second injection, (40 to 60 cc.)

These third injections of herterologous serum caused, in four cows, fifteen to twenty minutes after the operation, anaphylactic complications. The attacks were characterized by nervousness, distress, an intense generalized itching, marked congestion of the skin, the udder and the visible mucosae, edema of the region of the vulva, urticaria, disturbing dyspnea and diarrhea. These disturbances lasted about an hour.

Thirteen months after the last series of injections, the herd was again injected, first as a prophylactic measure, and second because new cows had been added, and third because anthrax was endemic in the district.

In order to avoid anaphylastic shock, Besredka's method of injecting fractional doses, injecting first a preliminary dose, 2 cc of serum only, followed after 45 minutes by the balance of the full dose. Ten to thirty minutes later, however, all the animals that had previously been given the second and third serum injections, showed symptoms of anaphylactic shock. Two of the cows that had reacted to the third injection, were severely affected; they lay down, suffered from intense dyspnea, respiration was intermittent. Liberal applications of cold to the chest had rapid effect on this alarming complication. Two hours later, the animals stood up, having completely recovered.

[1] Complications Due to Anaphylaxis in Dairy Cows Caused by Injections of Anti-Anthrax Serum, by Melandi and Stylianopoulo; *Revue General Vétérinaire*, June 15, 1928; translated by C. H. Schultz, Chicago.

From these observations, we can make the following practical conclusions.

1. Cattle are very susceptible (sensitive) to injections of heterologous serum (horse serum) and anaphylactic complications may follow after the second and even more so, after the third injection of such serum.

2. It is advisable (indicated) to use a homologous anti-anthrax serum.

3. Two mils of serum, injected forty-five minutes before injecting the remainder of the full dose, have been demonstrated to be insufficient to prevent anaphylactic complications. It may be that a greater interval of time is necessary to obtain the desired results.

A TRIBUTE TO THE DAIRY COW

Blind Homer sang of Trojan wars and heroes; Horace, of love and Falernian wine; Dante, of the infernal regions; and Milton, of Paradise; but if I had the genius of all these masters, I would sing with all my heart and soul of the cow—proclaim her virtues to the world.

Were I a sculptor, I would search the quarries of the world for the purest, whitest marble, and in an enchanted wood, where the skies are bluest and the waters purest, and the birds sing sweetest into the soft and mellow moonlight, I would begin a work of love and duty.

Soon a cow would stand revealed, wide and kind eyed, in a posture of patient waiting to give the rich contents of her swelling udder, and bless the receivers with joy and strength. Around her I would carve the figures of dear little babies, their hands and expectant faces raised toward the one that puts the firm, pink flesh upon their tender frames, the one that brings dimples and smiles like the touch of angels' wings, when the sweet, life-giving milk trickles in a velvet stream down their tiny throats, until the bottle falls away and sleep comes to caress and hold them still in its protecting arms.—Malcolm R. Patterson, Nashville, Tenn.

DEPRAVED APPETITE IN A COW

Late in the afternoon on a cold windy day not long ago, I was called out on the coal mountain road to see a cow that the owner said was eating foreign bodies consisting of soiled bedding, boards from the wall, manger, etc. Naturally, on receiving this history, my mind turned to rabies. On arriving at the farm, I found the patient to be an ordinary cow in fair condition. She was stabled in a shed on the cold side of the barn. There were large cracks in the siding.

The first thing I prescribed was stopping the cracks, which was done by placing fodder around the outside. She had eaten up everything in reach of her and was continually biting her legs but she had not got the skin off. There was almost entire cessation of milk flow; temperature was slightly above normal, but as her eyes looked normal, I began to eliminate rabies from my mind as a possible diagnosis, but I cautioned the attendants to take no chances.

Upon inquiring into the feed she had been receiving, I got the impression that she was receiving an over abundance of concentrates, therefore besides other medication I prescribed a bale of straw to be given at once. As it was now nearly dark, I departed for home.

Ten days later when passing the house I stopped my flivver long enough to inquire about the cow and was told that she was now back on her normal milk flow and had shown no more signs of depraved appetite, and after assuring the owner's wife of my pleasure in learning of the complete recovery of her cow and telling her if she needed my services any more to call me, and being assured that she would do so, I proceeded on my way. I have a notion that there was some of the vitamins lacking in the feed of this cow, but whether it was vitamin A or his brother B, I am not prepared to say.

Rembrandt Morgan.

Winfield, W. Va.

A Case of Preparturient Paresis

I WAS aroused from my slumbers early one morning by an urgent call to come out at once and see a very sick cow.

On arriving at the scene of action, I found the ailing animal staggering around the lot in a distressing fashion. She seemed to be trying her best to remain on all fours. With difficulty we steered her into the barn, where she collapsed. The animal would keep trying to rise, only to fall helplessly. She appeared so distressed and excited that one-fourth grain of lobelin sulphate was administered hypodermically immediately.

My first impression as to the cause, was that much spoken of term which covers a multitude of the sins of ignorance, forage poisoning. Just about the time we were getting our patient in the barn, I heard those old familiar words from the owner: "What is the matter with her, Doctor?" I replied that it looked like a case of forage poisoning, and that regardless of what is was, it seemed apparent that all was over but the skinning, and the owner appeared to heartily agree with me on that point.

On questioning the owner, I received the following history. The evening before when brought in from the pasture, this animal appeared rather weak and lagged behind the others. She ate and drank a little. The cow was dry and due to calve in about six weeks. She was a grade Jersey and gave about four gallons when fresh and the owner stated that she was one of his best cows.

The clinical appearance was as follows: Marked muscular weakness, distressed and excited appearance to the face, labored respiration mainly due to struggling, moderate salivation, body cold and damp, temperature 101.°F. If left alone she would quiet down somewhat but any attempt at handling made her worse.

About fifteen minutes after giving the lobelin, another hypodermic injection of a cardiac tonic was given. I did not have any botulinus antitoxin with me. It looked like a hopeless case and not a great deal could be done. I stood there gazing at the patient trying at least to appear intelligent and at the same time sympathetic. Suddenly it occurred to me to inflate the udder. It could do no harm. I needed something to do and hoped that it would settle the patient down a bit. The udder was inflated and air retained by using anteseptic wax dilators.

We then took time out for breakfast, returning to the barn in about half an hour. She had quieted down and lay in much the same position as a milk fever patient. A purgative with aromatic spirits of ammonia and hot water was administered orally. The cow got up about six hours later and made an uneventful recovery. Six weeks later she gave birth to a nice heifer calf with no trouble whatsoever.

I have treated a good many cases of milk fever in cows and also plently of forage poisoning cases, and there was no doubt as to their correct diagnosis. A dry cow does not have milk fever, at least not six weeks before calving.

I never have seen a cow as sick as this one, get well, if the trouble was forage poisoning, in fact they do not. This cow's recovery was almost as spontaneous as in the normal milk fever case. There was hardly a doubt in my mind at least, that this animal was suffering from a paresis and that it was pre-parturient, but what caused it?

These unusual cases happen in any one's practice but one is apt to dismiss it from his mind and is soon forgotten. I have never had a case like this one before and its rather surprising out come has caused me to give it more consideration. As to the cause in this particular case, I hope someone else will comment on it. One thing I can say is that I believe inflation of the udder saved this animal's life. However the heart stimulant was beneficial as supportive treatment.

L. D. MEYERS.

Haxtun, Colorado.

Indigestion in Cow with Peculiar Sequelae

By JOHN W. BROWN, Ft. Scott, Kansas

THIS case report should serve as a caution to practitioners to trace carefully the cause in all cases, however simply they may seem. It is also a further illustration of the fact that tuberculin testing should be regularly carried out and the results closely scrutinized, to get those old rotten cases that fail to react at times.

This cow was a mixed breed, Jersey and Shorthorn, about eight years old. The owner called at my office one morning in December to get a treatment for a cow which showed symptoms of indigestion. Not doubting the owner's diagnosis, he is an experienced dairyman, but following an established custom of mine never to prescribe for an animal I have not examined, I told him I would make a call to the farm soon.

Later the same day, I arrived at the farm and found that the cow was a greedy feeder. Her ration was ensilage, bran, corn chops, alfalfa hay and water from a tank with no heater. The bowel movements were scant, no signs of rumination, muzzle dry, and had a slight rise in temperature. She had been bred about three months, and her milk supply was reduced more than half. There was evidence of impaction of the rumen. Treatment prescribed was to remove all food, have plentiful supply of water at hand, and gave a rumen stimulant (barium chlorid, tartar emetic, strychnin and ginger).

As soon as rumination was stimulated, a quart of oil was given. In two days the animal was on the road to recovery, and only a small amount of food was allowed with a gradual increase each day, so that by the fifth day after resuming feeding the animal was on full feed. The first two days after resuming feeding, the animal was given the rumen stimulant about once a day. By the fifth day the cow was fully recovered and gaining slowly in milk.

Three weeks from the time I treated this animal, the owner returned stating that the cow had been doing nicely, but for the last few days, he had noticed her straining and this particular morning she was straining terribly hard; making efforts at micturation and dribbling urine. She would lie down at times act as if in labor.

I went to the farm to see the animal immediately. As she was just three months bred and no contagious abortion was in the herd, I was perplexed, yet thought my past treatment might have influenced this although it never had before I just made an examination of the vagina . Everything was alright. I next made a rectal examination and there I met what I think might be interesting to the profession and that is the reason of reporting this case.

I could hardly get my hand into the pelvic opening, I found such a large mass. Finally, I did locate the rumen. It was in proper place, but not nearly full. On palpating, this enlarged mass seemed as large as the abomasin. Due to trickling of urine, for a moment I thought that maybe the bladder was twisted on the neck and enlarged, but on passing a catheter the urine flowed freely and there was no twist.

Then it dawned upon me that I was dealing with an abscess and in all probability a tubercular abscess. The point I wish to emphasize is, it was so large that I could not wholly outline its circumference. It was on the right side in the illiac region. With the left arm in the rectum and pressing slightly, I could see the swelling in the triangle in the right flank. On informing the owner of my findings, and that I suspected tuberculosis of the right ovary and fallopian tubes, he was shocked, as I had tested his herd twice within the last three years and never observed a reaction. Poor observa-

tion some would say. I am accused by some of reading my reactions too close, but let's pass that up. I explained to the best of my ability that we had an abscess, an extraordinarily large one. What to do? The only thing to do was to drain and try to salvage the cow for a canner, as the way she was straining she might rupture it at any time. No one would buy her the way she was as she was liable to die at any moment.

My procedure was to save the hair in the region of the right flank down lower than you would on the left side if you were going to tap, and paint the area with tincture of iodin. I sterilized my cattle trocar by boiling and plunged it into the mass near the posterior border of the triangle mentioned above and about four or five inches below the lumbar precesses, and drew off two gallons of pus and a quantity of gas. This was partly done by rectal pressure on the mass. The use of the large trocar was due to the fact that I suspected it was a tuberculous abscess and that I would find large cheesy masses, and so it turned out. These masses when cut with the knife would give a gritty sound. A number of these passed through the trocar. I took some to the office, and demonstrated a few acid fast bacilli. Not many, probably due to faulty staining, as I was in a hurry, and too, one does not always find large numbers of the bacilli in these abscesses.

After tapping the animal was relieved of straining almost immediately and began eating. The owner kept the animal for two weeks increased her feed and put her in fair condition. In fact, she never was poor and was going to ship her to the Kansas City market as a canner, but the abscess returned, which was to be expected, and for sake of learning just how she looked, he killed the animal and I performed the autopsy. I found abscesses of the right ovary and several in the momentum, in fact the whole abdominal cavity at this time showed recent infection.

In concluding this article, I believe this animal has harbored this infection for several years. I am preparing to re-test the herd. Needless to say the carcass was burned and the barn disinfected thoroughly.

Why had this animal not given me a reaction to the tuberculin test given about a year ago? I cannot explain, other than that this lesion was active, and there was such a large amount of tuberculosis toxin in the system that the small amount given in the intradermic test did not excite an observable reaction.

SANITATION—INSPECTION WILL PAY

My advice is "go in stronger than ever for practical sanitation." Take the local veterinarian into your fellowship—he can help you, and you can benefit him in his profession, both as to baby chicks, breeding stock and market poultry, through your experiences and his training.

The Golden Rule man or woman no longer sends sick poultry to market. The local veterinarian is (or should be) the guardian of local poultry health. Your veterinarian will send any doubtful specimens to the State College or the State Poultry Station for special identification.

Being so little called upon, too many of the local Veterinarians are too little experienced in the details of poultry diagnosis and treatment, but the veterinarian has a professional-scientific training as a foundation that few (if any) of the hatcherymen have ever had in surgery, medicine and sanitary science. The veterinarians will heartily react to this proposed contact with commercial hatcheries.—From an address by the Hon. Jewell Mayes. See Missouri State Board of Agriculture at the Annual Convention of the Missouri Baby Chick Association, Kansas City, Nov. 17, 1928.

BOVINE TENAISIS

Tenaisis in cattle, according to some authorities, is relatively common in this country; however, practitioners rarely report such cases. This condition has been identified in a herd of cattle in southeastern Kansas. In this particular outbreak the offending parasite was the *Taenia alba*. The symptoms manifested were unthriftiness, digestive disorder and particularly diarrhea.

FOOT-AND-MOUTH DISEASE ERADICATED

The United States is again free from foot-and-mouth disease. An official order of the U. S. Department of Agriculture, effective March 18, removed the quarantine placed upon the limited affected area in California. The outbreak was of the shortest duration and involved the smallest number of premises and animals of any of the outbreaks of this disease that have occurred. It also caused the least interference with agriculture and industry in the surrounding territory.

BOVINE TUBERCULOSIS ERADICATION IN NEW YORK

The number of animals condemned on account of tuberculosis during the fiscal years ending June 30, 1919, to 1928, inclusive in New York state was as follows:

1919	2,097
1920	6,842
1921	20,702
1922	10,780
1923	33,686
1924	39,149
1925	53,431
1926	63,963
1927	67,631
1928	54,945
Total	353,226

The destruction of these tuberculous animals has reduced the infection in New York State from 28 or 30% in 1918 to approximately 10% at the present time.

BIG WAITING LISTS IN TB ERADICATION

More than 2,000,000 cattle were on the waiting list for tuberculin testing at the end of 1928. This fact indicates an attitude of effective cooperation on the part of stock raisers and dairymen generally, and also that the 1929 record of tuberculin tests is likely to rank high in comparison with other years.

On January 1, a total of 629 counties in the United States had been recognized as "modified accredited areas, and cattle in accredited herds numbered 2,164,105. More than 23,000,000 cattle are in herds under bureau supervision for the eradication of tuberculosis, and the waiting list on January 1 numbered 2,160,517 cattle. In 33 States the demand for testing has outstripped the facilities for prompt response to applications, but the work of testing is proceeding rapidly. The test was administered to 845,971 cattle in December.

WISCONSIN SPEEDS TB ERADICATION WORK

Thirty-eight counties in Wisconsin are now classed as modified-accredited areas, the infection being less than 0.5%. Five additional counties have filed petitions and will be tested as soon as the work can be arranged. Only four counties of the State have not yet filed petitions to have all the cattle tuberculin tested.

More tuberculin tests were made in Wisconsin during 1928 than were made in a year in the entire United States seven years ago. Altogether 1,560,289 cattle, nearly all dairy animals, were tested in the Badger State last year.

COLLEGE CLINICS

Clinical work in the Veterinary Department of the Kansas State Agricultural College at Manhattan is constantly increasing in numbers. The following is a summary of the number of cases handled in the veterinary clinic for the past five years:

1923-24	3,599
1924-25	4,488
1925-26	5,764
1926-27	6,964
1927-28	9,841

For the 1927-28 college year there were treated by the clinical staff 439 horses, 2,224 cattle, 4,670 swine, 1,323 dogs, 567 sheep, 361 poultry, 152 cats, 16 goats, and 89 miscellaneous small and wild animals.

Students have actual contact with all of these cases.

OVARECTOMY IN HEIFERS

The spaying operation in heifers is one that we do not see a great deal about in our current veterinary literature and from the information available, I judge the operation is not practiced as extensively as it should be. I believe it the duty of the veterinarian to explain to the stock feeder the benefits to be derived from the operation and to encourage the practice of ovarectomy wherever heifers are being fed for market.

Having had the opportunity to observe the results obtained on a large herd of spayed heifers from the time of spaying until ready for market, I do not hesitate to recommend ovarectomy to my clients, and not once has the stock owner been dissatisfied with the results following the procedure.

Spayed heifers not only bring better prices than the unsexed animals but they make faster and larger gains. The feeder is not troubled with the animals coming in heat, which annoyance not only results in shrinkage to the animal in heat, but to the entire herd due to their riding and chasing around. In the case of unspayed heifers where a bull is put with the herd and the heifers bred, it frequently results in disappointment to the feeder at market time. If the market price does not suit the conditions he has two problems to face; either sell at a loss, or hold the heifers awhile and risk taking a dock, due to their advanced stage of pregnancy. Another argument in favor of ovarectomy.

In my experience the spaying operation is not attended with any more fatalities than the castration of the male. In this community it is the custom of the feeder to buy up a bunch of heifers in the fall and the operation is usually performed in October or November, just prior to placing the animals on feed. The calves are usually from six to eight months of age at the time of spaying.

The operation is performed in the standing position, using an ordinary chute for restraining the animal. One side of the chute is so arranged that the top boards may be removed after restraining the animal in order that the operator may have free access to the field of operation.

After the usual preparation of the field of operation the incision is made at the site of ordinary laparotomy in the cow. (I prefer the left side.) The incision is carried through the skin only, the rest of the opening made by forming the fingers into a cone and with a rotary motion, boring through the fascia and muscles down to the peritoneum. When the latter is reached it should be punctured in a way that will prevent as much as possible its separation from the abdominal wall.

The ovaries are located and ablated with a long handled ecraseur and brought out. By removing both ovaries from their attachments without removing the arm lessens the chance for infection and also is less irritating to the margins of the incision.

The wound is then treated with some mild antiseptic and sutured. (For an antiseptic dressing I use a 5% solution of acriflavine.) By boring through the muscles as described above the opening closes as soon as the arm is withdrawn and three linen sutures in the skin only is all that is required. As a rule the wound needs no further attention. If the operation is performed during the fly season the skin wound should be daubed with pine tar or given other protection from these insects.

In preparing the animals for the operation all bulky feed should be withheld for twenty-four hours. It is not necessary to starve the animal but if it is allowed to consume large amounts of roughage the rumen will interfere to some extent with the operation.

After the operation roughage should be fed sparingly for a day or two to prevent an overloaded rumen interfering, by mechanical irritation, with the healing of the wound.

While this article is not intended to

enlarge upon or advance any new line of technic relative to the spaying operation the writer hopes it will encourage the practitioner to bring to the attention of the stock owner the benefits he may expect from ovarectomy in financial returns as well as a more docile and satisfied herd during the feeding period.

The operation is one that is not attempted by the average layman, is remunerative to the practitioner and he is rendering a real service to his clientele by recommending it.

Powersville, Mo. W. B. Chapman.

THE DOG A RESERVOIR OF THE BROAD TAPEWORM

Broad tapeworm is common in the wall-eyes and great northern pikes of the large Canadian lakes. The fish in Lake Nipigon apparently are the most heavily infested. The adult worms have been brought over from Europe by infested Scandinavian, Finnish and Russian immigrants.

In some small lakes in lumbered forest regions, from 50 to 75 per cent. of the wall-eyes and great northern pikes are infested.

The lumbering concerns employ Scandinavians and Finns almost exclusively; they cause the original infestation of fish in the small lakes, and as lumbering operations advance they move on.

Indians and others feed their dogs on raw wall-eyes and great northern pike; the dogs become an important reservoir of broad tapeworm and reinfest the fish in the lakes. Dogs are capable of harboring from five to nineteen broad tapeworms.

Fish in lakes near Indian reservations are most heavily infested. Three large Indian reservations are located on the shores and islands of Lake Nipigon with another reservation on the Nipigon river, which probably accounts for the heavy infestation in the Nipigon fish.

Indian agents and teachers should be instructed to teach the Indians the necessity of cooking fish even for dogs for the sake of dog, fish and man.

Lumbermen and their families in lumber camps should be inspected for tapeworm and treated if infested.

The importation of adult tapeworms by immigration should be prevented.—Jour. A. M. A., Vol. 92, No. 8.

INJURY OF TRACHEA IN A MARE

One afternoon last spring, a client came to my office saying that something was wrong with his eight-year-old mare. "I have had much experience with horses," he said, "but this has me puzzled. I doubt if you can tell what is wrong with the mare." From the owner's description of symptoms, it was not possible to make any diagnosis, so the owner asked me to come to his farm.

I found the mare standing in a single stall eating hay, temperature, pulse and respiration normal. Not a single symptom of abnormality seemed in evidence.

The history the owner gave was that the mare lagged in the field a few days before; that she could stand no work at all, whereas before it was difficult to tire her. While I examined the mare in the barn, I observed the condition of the stall and manger closely. I had the owner lead the mare from the barn and trot her across the barn lot. With so little exertion there was a very marked dyspnea.

The symptomatology I had thus far observed convinced me it was a different condition from any I had previously met in my practice of seven years. The lungs were in good condition, the mare was not a true roarer; she had no heaves, and she had no influenza or distemper. She just went wrong all at once as the owner said. From what I had so far noted, I felt the trouble must be somewhere in the trachea. I began manipulating the trachea and soon found that about midway between the throat and chest a small amount of pressure would almost shut off the wind entirely. The trachea seemed flattened.

The wonder to me was what had

caused this flattening. She had not been kicked so far as the owner knew. There was no mark on the skin. I noticed when I was in the barn that the manger was very, very high. There was a ground floor and in front of the manger it was badly pawed out. I now had the mare led to her stall. She was given some hay. When she reached down to eat the hay, she would bring great pressure to bear right at the flattened area.

I then told the owner that the high manger caused the trouble. The mare had been in this stall for over a year. The trachea no doubt became flattened gradually but it was only after the lumen became occluded sufficiently to effect the breathing that the condition came to the attention of the owner.

The mare was absolutely worthless in her present condition. This was an unusual case, I told the owner. I wanted a little time to make a study of it, so I told the owner to saw down the manger and turn her on grass and if she did not improve we would do something later; but that there was no hurry. I began searching the literature for the best possible treatment in case any surgery was to be attempted, but found practically nothing of any help for there were no cases reported that were similar to this one.

I asked Doctor Guard of the Iowa State College, whether they have had any similar cases at the clinic. They have not had a similar case, but Doctor Guard gave me some good suggestions in case I must resort to surgery.

In the meantime, the mare had been on grass and she seemed to improve slightly, but accidentally she got to the barn and being loose she reached over another high manger and immediately the owner said she was much worse.

She was on grass for six weeks and then hitched again, and was apparently sound. No surgery was needed. After the aggravating cause was removed Nature alone restored the trachea to a sufficiently normal condition to permit unhindered breathing.

The one thought I wish to leave in closing is that close observation helps us greatly in coming to a diagnosis. For when I saw the high manger as a fact by itself, it did not mean much, but when I saw the mare move and noticed the peculiar symptom concerning her breathing, in my own mind, I immediately began to incriminate the high manger as the cause, although I said nothing to the owner until I was sure of the fact.

S. P. Holtz.

West Point, Ia.

IN TIME OF DISASTER—THE RED CROSS

The service of the American Red Cross in disaster during the past 48 years has been spectacular and dramatic, competent, purposeful and to the point. Great caravans of medical supplies have been rushed to the scene of disaster, tons of food have been purchased, thousands of meals have been cooked and set before the hungry, and sufficient shelter set up to make a hundred busy towns. Money in the amount of $49,594,000 has been expended in 938 disasters within these United States.

Through her 3,500 Chapters, the Greatest Mother in the World has a hand in every calamity which besets her children. In cyclone, tornado, hurricane, storm, fire, flood, epidemic, building collapse, wreck—wherever the elements run riot or man in his race for a goal has endangered his fellow men, she is there. There is her standard, the flag of the Red Cross, set solidly as a sign of hope in the midst of the chaos of calamity, and under her banner springs up a new civic leadership, having a place in it for people of every political, social, religious, national or racial complexion.

When there is need, every town and hamlet joins in the outpouring of concern. Industries and business groups everywhere give lavishly of their time and products, and there is widespread enlistment of sympathy and generous spirit of our people.

NEW VETERINARY BUILDING AT MISSOURI FAIR

The Missouri Veterinary Medical Association last year launched a pioneer movement, which is declared to be the first of its kind in America. This was the erection of a building on the Missouri State Fair grounds where the state association has ample opportunity during the eight days of the annual exposition to acquaint thousands of visitors with the necessity of an animal health program.

And having this splendid new brick building on the grounds will mean more active participation in the program at the 1929 Missouri State Fair, August 17-24, by the Veterinary Association. The new building was erected last summer and was dedicated during Fair week with an auspicious program. The construction fund of $5,000 was secured by donations from the membership of the association. The new structure is located west of the University Building and is classified as one of the most attractive medium-sized buildings on the grounds.

Entering, visitors find themselves in a spacious lobby. On the left side is a modern and thoroughly equipped rest room for the ladies. On the right side of the lobby are the offices of the Secretary of the Missouri State Board of Agriculture and director of this department at the State Fair, and Homer A. Wilson, State Veterinarian and department superintendent.

The auditorium will accommodate about 300 persons and it is here that visitors have opportunity to learn the finer parts of the department's work. During Fair week the auditorium is converted into a small theatre. Motion pictures, featuring the service rendered by Missouri veterinarians in coping with cattle tuberculosis, hog cholera, chicken cholera, fowl tuberculosis and modern methods of diagnosis and eradication, are shown.

During Fair week, representatives of this office may be seen on inspection tours of the various buildings on the grounds which house live stock. All cattle barns are thoroughly disinfected under this department's supervision before the opening of the exposition and the State Veterinarian takes every possible precaution to prevent the possible spread of any disease among the cattle. Owners of live stock are asked to show health certificates for their entries before entering their cattle on the grounds. This matter also is in charge of the State Veterinarian, Wilson.

The director and superintendent of this department at the State Fair, with the assistance of other members of the association, are planning a more comprehensive educational program for the benefit of thousands of visitors at the Missouri State Fair next August. At that time, the home of the Veterinary Association will be one of the busiest spots on the grounds, asserts W. D. Smith, Secretary of the State Fair.

A TRIBUTE TO THE HORSE

What friend has man, truer, less appreciated and more abused than the horse?

The fidelity of the dog, the courage of the lion, patience immeasurable—these are the attributes of the horse.

The Light Brigade at Balaklava, Waterloo, Sheridan at Winchester, Paul Revere's classic ride—none of these heroic events could have been but for—the horse.

A faithful servant in times of peace, a noble aid in times of war, the very soul of mighty conflicts, courageous and steadfast—the horse.

In the fields of the world, with the herds and flocks, on verdant plain or barren waste, what is the one indispensable prop on which laboring humanity leans? What is the one unfailing servant to the world's endless demand for food? To what do we turn when Pluvius makes bogs of our fields or when suffering cries out for succor in the dead of winter? What? The horse!

The horse—dumb and yet eloquent. A mind irrational, yet, by the power of an inexplicable instinct, distinguishing be-

tween good and evil, in a way marvelous to man.

In this age, of much vaunted mechanical perfection, there are those who brand the horse a relic of by-gone days; consider his presence a hindrance to progress; those who would banish him to a realm soon to be forgotten. Were their cold and material plans realized, could we forget the mount of warriors? The friend of children? The faithful helper in our work? The companion of our leisure? Driven, ridden, loved by a multitude, could we? No!

The passing of the horse would bring an end to advancement. He is an indispensable adjunct to agriculture the world over. An inherent love of the horse goes with a love of the soil. Remove him and the greater part of the world's arable land would lie fallow. Remove him and few would follow the arduous, thankless toil of farming.

God grant that the ingenuity of man may devise some means of freeing the horse, so far as possible, from the bondage he has patiently endured, since his advent into the life of man.

All ye in the lap of plenty, all ye who break bread, know that famine would rule with its cold relentless hand; that the fields would be wildernesses; that death would be in the land, with its train of woe, but for—the horse!

Oscar R. Whilden.

New Orleans, La.

"The people who have achieved, who have become large, strong, vigorous people, who have reduced their infant mortality, who have the best trades in the world, who have an appreciation of art, literature and music and who are progressive in science, and in every activity of the human intellect, are the people who have used milk and its products liberally."—E. V. McCollum, Johns Hopkins University.

A CASE OF NARCOLEPSY IN POULTRY

We call narcolepsy an exaggerated tendency to sleep—unsurmountable sleep, if you like. In human medicine, such a syndrome is imputed to digestive or cardiac affections, and it is said to be often the first symptom of diabetes. Narcolepsy is also met in neurologic cases such as epilepsy and hysteria.

I saw recently a typical case of narcolepsy in a fowl, a White Leghorn, detected in a pen of laying-hens. It was first noticed that she was constantly on the roost, crabbed and sleepy; this strange look was observed for several consecutive days. Knowing not what this disease could be, the manager of the poultry farm sent the hen to me.

The clinical examination proved that the fowl had not eaten for many days. The excrements were normal; the respiration was deep and the temperature somewhat below the normal. The points of the comb were lightly violet-colored; beak and eyes were normal when the fowl was awake. Was she roughly awakened by pushing her, she started croaking, walking a few steps; but, the stimulation having ceased, she would again become sleepy and so profoundly that her head and legs were close to the ground.

The hen was placed in a cage, where she stood for two weeks without eating or drinking.

What should I do with such a puzzling case?

I decided to use an anthelmintic remedy, and I injected into the gizzard, with a long catheter, a dose of colloidal iodin. Twenty-four hours after, a nice reaction was noticed; three days later the hen was normal.

What is the cause of this strange disease? Does it originate through an intoxication of intestinal origin? Is it alimentary or parasitic? Had the worm-killer neutralized the toxines, or eliminated the worms? On the other hand, does the long fast permit the hypothesis of an auto-infection?

These are many questions put to our readers, and, no doubt, they could require a long scientifical discussion were they laid before a meeting of a Veterinary Medical Association.

For a fowl a fast of three weeks is more than ordinary.

Now, is this disease identical to the one called "Sleeping Disease of Fowls," caused, it is contended, by an organism technically named *"Streptococcus capsulatus gallinarum"?* The question is hard to answer as there was no bacteriological examination specially performed. However, the symptomology given for sleeping disease does not exactly correspond to the one observed in the present case.

B. M. Gabriel.

Oka, Quebec.

HEM. SEP. OR PARASITES IN SHEEP

My method for handling the sick sheep west of Kansas City would be as follows: (See page 97, March issue of VETERINARY MEDICINE).

First ascertain if there is any hemorrhagic septicemia by laboratory diagnosis. If so, I would use hemorrhagic septicemia aggressin as that has given me better results in sheep than the bacterin. I would then put the flock on soluble sulphur, as that is par excellence in stomach worms. It might be necessary to give some of them a capsule for tapeworms.

I doubt that he would get any great good from Fowler's solution, although it would do no harm.

Hull, Iowa. A. N. Overbaugh.

TAPEWORMS IN SHEEP

Can you give me a reliable treatment for tapeworm in sheep?—L., North Dakota.

Reply: Worm the dogs well. Change the quarters of the sheep. Then give them a round of good vermifuge containing oleoresin male fern and kamala. A good lick, mixed with salt can be used. Ten pounds soda, ten pounds sugar, ten pounds lime and four ounces potassium iodid mixed in a thousand pounds of salt, isn't bad. If the animals are badly infested with tapeworm about the cheapest method of control is to go out of the sheep business for about three years and begin with a new lot.—E. T. B., Idaho.

WHAT SHOULD BE DONE WITH CHRONIC "COLICKERS"?

"Came the dawn," as they say in the movies; it marked the end of a bitter cold night, and was even colder as I was called out five miles to see a horse with the colic. Upon arriving at the farm, I found an eight-year-old black gelding. He had taken sick some time during the night and was wet with perspiration and rolling and tumbling about and falling as though he were trying to burst himself against the ground.

Apparently he had just what my client said he had. I began treatment at once, and kept it up intermittently all day, and the patient kept at his job of rolling, with short intermissions all day.

I left him at dark, fully expecting him to die before another morning. I heard no more of the case for two weeks. Imagine my surprise one day to see this horse working in the wagon, apparently as well as ever. It is not the purpose of this article to describe my line of treatment any further than to say that it has given me good results in about 70% of the cases.

Not long ago I read over the signature of an eminent practitioner that he had a colic remedy that allowed him to get away from these cases in thirty minutes. All I have to say about his treatment is that I would like to see him get away from this horse in the time specified unless he just went away and left him. I once asked an old horse trader what he did when he got a horse that was subject to colic, and he said he always traded him off right quick so he would die on the other fellow's hands.

And, acting on his advice, I gave my client a gentle hint that he ought to do some trading, but as he is not a born trader, he has not disposed of him yet, and I am almost afraid to answer the telephone for fear of another all day's siege with possible fatal termination next time.

Rembrandt Morgan.

Winfield, W. Va.

Mycotic Pneumonia in Cattle

By C. C. PALMER, Newark, Delaware

A FORM of pneumonia caused by the inhalation of great amounts of molds occurs frequently in poultry and is seen occasionally in mammals. In poultry the disease is frequently referred to as aspergillosis, deriving the name from the genus name of the mold, aspergillus. Buchanan[1] reports, Mayer and Emmet, in 1815, were probably the first to note the presence of aspergillus in the lungs of a bird. Since that time, the organism has been reported many times. Among animals, the disease has been reported occurring in horses, cattle, sheep, swine and dogs. It has been observed in man. In most cases no careful species determination was made, but the probabilities are greatly in favor of *Aspergillus fumigatus* being the species responsible. In animals, the disease is known as mycotic pneumonia, also as pneumomycosis.

There is sufficient experimental evidence, according to Buchanan, to justify the conclusion that *A. fumigatus* may produce a primary and fatal infection in many animals. It produces death within a few hours or days when injected intravenously or intrathoracically into the chicken. The pigeon is particularly susceptible to injections. Rabbits and guinea-pigs likewise succumb, usually from a generalized infection. Natural infection takes place through inhalation of the organism when forage containing the mold in great numbers is employed for roughage or for bedding purposes. In this way a primary infection of the respiratory organs occurs, but metastatic infection of other organs is not infrequent. When lung tissue is involved the small and large air tubes become occluded by the green fructifications of the fungus, and there is more or less necrosis of tissue immediately surrounding the organisms.

Hutyra and Marek[2] state—"the symptoms and course of the disease are frequently similar to catarrhal pneumonia, and the clinical picture is therefore initiated by symptoms of bronchial catarrh." In typical outbreaks in cattle the history and symptoms suffice for making a positive diagnosis. In isolated cases in which the clinical picture is not complete a diagnosis may be made, usually, by the character of the lesions and the appearance of the green mold in the air tubes and alveoli. A microscopic examination of the scrapings of the infected mucous membrane should reveal the spores and characteristic condiophores without difficulty.

A Case of Mycotic Pneumonia in a Cow

The following case report affords an excellent example of what may occur when cattle are fed extremely moldy roughage:

On May 21st, 1928, a call was received from a dairyman, stating one of his cows was suffering from choke. Examination of the patient revealed the owner's diagnosis was incorrect, the animal was suffering from pneumonia. The history revealed the cow had been sick for about one week. She had a severe cough, and this was true of all members of the milking herd of sixteen cows. During the past few days the patient had refused feed and there existed a marked decrease in milk secretion. It was this last named symptom, more than any other, which alarmed the owner. When questioned concerning the symptoms shown by other members of the herd, the owner replied—"they are all milking and eating well, except the sick cow, but all of them have a cough—they cough so much and so hard during milking they almost jerk the milk pail out from under them."

The patient, although refusing feed and showing marked pulmonary disturbance,

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[1] Buchanan, R. E., Veterinary Bacteriology. W. B. Saunders Co., 1916, P. 443.

[2] Hutyra, F., Marek, J.: Special Pathology and Therapeutics of the Diseases of Domestic Animals. Alexander Egar, 1917, Vol. 2, P. 158.

was not in great distress. The temperature was 103° F. The respirations were accelerated and abdominal in type (pumping). Auscultation with the stethoscope revealed considerable exudate present in the left anterior thoracic region. It was rather difficult, at first, to determine whether the exudate was present in the lung tissue or in the pericardial sac. The heart sounds were barely distinguishable amid the gurgling sounds emanating from the exudate. Occasionally there would occur a brief pause in the respirations, and during such intervals the heart sounds were clear and distinct and the gurgling sounds were suspended. When breathing was reestablished the gurgling sounds were again established. The respiratory sounds emanating from the right side of the thorax were apparently normal. Spasms of coughing occurred several times during the course of the examination.

Observations of other members of the herd revealed the truth of the owner's statements as far as the cough was concerned. Their appetites were normal, apparently, and there was no evidence of lung involvement. The cough, of course, indicated bronchitis.

Investigation of the management practices revealed the herd was stabled at night, and kept in the "pound" (a down-east expression) with a shed for shelter during the day. The herd was not on pasture. Examination of the feed revealed the cows were receiving as a concentrate feed, a commercial dairy ration, mixed with home grown concentrates, yielding a protein content of approximately eighteen per cent, which is about correct for an ordinary working herd. This feed appeared to be of good quality. The roughage consisted of soybean hay which contained large quantities of mold. The owner was aware of the moldy soybean hay, but as he had no other hay he thought he could feed this until the cattle were placed on grass. Soybean hay is a splendid roughage for dairy cattle, when harvested properly, but unless it is properly handled it is very apt to contain much mold, in which condition it is unfit and dangerous for feeding.

MYCOTIC GASTRO-ENTERITIS

In a feed lot containing 110 two-year-old steers the care taker reported three deaths and four sick steers. Upon investigation it was found that the steers had been given ear corn, cottonseed cake and orchard grass hay. The corn and hay were average quality, but the cake was very moldy. Until three or four days before the first steers sickened a good quality cake had been fed.

The principal symptoms observed in the four sick steers were: tucked-up abdomen, diminished appetite, some incoordination, staring eyes, and in two there was a marked diarrhea. The moldy cottonseed cake was considered the source of the trouble and a tentative diagnosis of mycotic gastro-enteritis was made, because it was realized that the condition might be coccidiosis or esophagostomiasis. The owner was advised to destroy the moldy cake and, until a wholesome supply could be obtained, to feed only corn and hay. The four sick steers were placed in a box stall in the barn and fed a mash containing one dram of powdered copper sulphate and four drams of ferrous sulphate daily. Three weeks later the four sick steers had recovered and no new cases developed. Was the diagnosis correct?

TURPENTINE DANGEROUS WHEN GIVEN TO STALLIONS

Turpentine is one of, if not the best of, all intestinal antiseptics and especially so in equine practice. It has held its place in the treatment of colics in the horse for many years by many of the leading veterinarians of the United States and Canada. In my practice, I have found it indispensable. I have, however, had some sad experiences with it. With one-ounce doses I have produced acute nephritis in a stallion three years of age. Yet, I have given three times the amount to geldings and mares with no bad results.

I have talked with other veterinarians, who have had the same bad results when administering medium doses to stallions. My advice is to never give a stallion turpentine.

Big Coal, W. Va. B. J. Riley.

An Osteogenic Tumor in the Head of a Horse

By IVAN C. HALL, Denver, Colorado
Department of Bacteriology and Public Health, University of Colorado School of Medicine

RECENTLY, while camping on Lime Creek near Marble, Colorado, at an altitude of about 9,000 feet, I came upon a neat pile of bleached bones of a horse among which was the skull herewith illustrated. (Figures 1, 2, and 3.) Although the specimen had been gnawed by rodents it was so unusual that I brought it home with me, about 250 miles. It was interesting to try to reconstruct and interpret the origin of the lesions upon this skull.

The skull was evidently that of an old horse, as attested by the marked attrition of the incisors. This horse had suffered apparently, for some time prior to its death, from a large osteogenic tumor upon the right side of its head, extending forward from the ear to the second molar and upward from the margin of the superior gum line to within 1.5 cm. of the median frontal synostosis. None of the fleshy portion of this tumor now remained.

When found, all of the teeth in the upper jaw were present except the last molar on the right side; the incisors not shown in the photograph were lost during transportation. Whether this tumor originated in the lost molar cannot, of course, be stated with certainty, but that is at least an alluring hypothesis. Dewey[1] recorded a molar osteoma in man.

There is a suggestion in what appear to be calcareous deposits upon the normal bone, of an osteomyelitis, probably secondary, extending forward from the edges of the new growth over the superior maxillary and nasal bones, in the latter case across the median line as the photograph shows. The supposition of an osteomyelitis is supported by the experimental fact that when a small fragment of the calcareous deposit was decalcified in 5% HCl it dissolved almost completely, leaving only an amorphous organic matrix without definite bony structure such as was found in the main portion of the tumor.

The growth of new bone invaded the roof of the pharynx, and the eye socket, but not the middle ear. It looks as if there had been a discharging sinus in the region of the malar process. The growth of new bone extended into the right anterior cerebral cavity and we may surmise that this animal actually succumbed to a meningitis as a result.

The lower jaw bones were intact and normal, as were apparently all of the other bones; there were no indications of metastases.

A small fragment of the growth was decalcified in 5% HCl, leaving a soft spongy matrix similar in form to the original piece. Examination of sections of the decalcified fragment revealed a histologic structure essentially similar to that of normal bone (Figure 4). I am indebted to Dr. W. C. Johnson, Professor of Pathology in the University of Colorado School of Medicine, for the preparation of the sections and his helpful collaboration in their study. He was inclined at first, on microscopic examination of the tumor, to consider it a malignant osteo-sarcoma and, while it is perhaps impossible in the absence of fleshy tissues to exclude that possibility, the failure to detect metastases in other parts of the fairly complete skeleton and the resemblance of the decalcified sections to normal spongy bone suggest the diagnosis of osteoma spongiosum as described by Mallory[2], though he states that it is sometimes difficult to distinguish between osteomas and tumor-like

growths of inflammatory origin. Ewing[3] also states that "histologic study fails, as a rule, to distinguish simple hyperplastic growth of bone from true osteomas."

Figure 1. Osteogenic Tumor in a horse. Front view.

Bemis,[4] in discussing tumors encountered in veterinary practice, stated that in his experience "all of the tumors affecting the bone have been osteomata. One appeared smooth, rounded, the size of a goose egg outgrowth from the lower mandible covered by the mucous membrane beneath the tongue."

An editorial in the American Veterinary Review[5] mentioned that 184 cancers other than melanotic sarcomas were observed among 40,000 horses by the Sanitary Veterinary Service of the city of Paris, France, but there was no reference to osteogenic tumors among those listed.

Both Mallory[2] and Miller[6] say that true osteomas are rare, and Feldman,[7] who made a special study of 265 tumors in domestic animals including 54 from horses, obtained from practicing veterinarians, packing houses, and other sources, was unable to secure any osteoblastomas and concluded that "they must occur very infrequently." Doctor Feldman stated in a personal communication dated October 31, 1928, that, "while osteogenic tumors of the lower animals have been reported in the literature in a few cases, they are among the least frequent animal tumors. In my own collection of nearly three hundred animal tumors, I have failed to encounter a single specimen of this type."

In man, on the other hand, osteogenic tumors are by no means rare, if we can judge by the numerous references in the literature. The interested reader will consult the extensive reviews of Ewing,[8] Ko-

Figure 2. Osteogenic Tumor in a horse. Side view.

lodny,[9] and Harris.[10] The last found records of 115 cases of frontal sinus osteoma alone, his own two making a total of 117.

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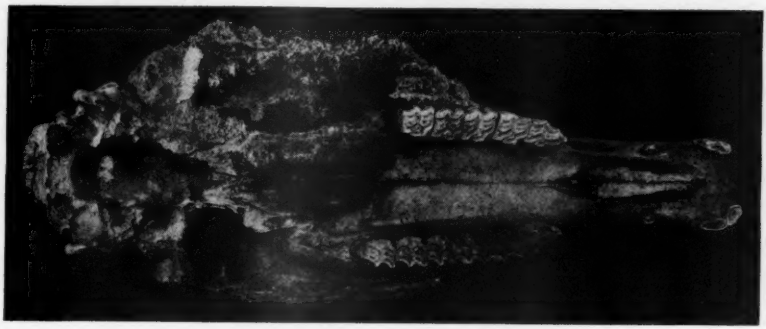

Figure 3. Osteogenic Tumor in a horse. Bottom view.

Figure 4. Decalcified Bone Section of Osteogenic Tumor.

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SALT POISONING IN CATTLE

Cattle losses in oil fields are of common occurrence. In oil producing territories, there is usually one or more cases during each court session to ascertain in a legal manner whether or not cattle are poisoned by the various by-products, such as salt-water, from oil wells. It is known that brine and water containing a large percentage of salt is injurious to cattle. It should not be difficult to determine the percentage of salt in the water from an oil well. The difficult problem is to ascertain the amount that an animal consumes.

Salt poisoning may be acute or chronic and if the water from an oil well is not charged with other salts than sodium chlorid the symptoms are usually sufficiently characteristic that the condition can be readily diagnosed. Oil operators as a class are usually willing to pay legitimate damages and this is usually satisfactory to the stock owner. There are instances in which expert professional services are required and veterinarians in oil producing areas should carefully study these problems.

CHRONIC INDIGESTION IN A CALF

I am treating a pure-bred heifer calf now, eleven weeks old. For the past month, it has been bloating on any kind of feed given it. The trocar has been used a number of times, but relief is only temporary. The calf does not eat half enough because it bloats so badly. Unless it is relieved it is going to die. Laxatives, soda in the feed and stomachic tonics have been unavailing.—L., Wisconsin.

Reply: Your description of your calf suffering from chronic indigestion indicates the trouble is probably due to one of two things.

First, to a hair ball, which would call for an operation.

And, second, but more likely, to overfeeding.

In cases showing similar symptoms the following treatment has given satisfaction:

Feed three times daily, an ounce of rich cream in eight ounces of water, having boiled both. Feed from a thoroughly clean bucket, and keep the calf in a clean stall.

If it has a tendency to eat the bedding, keep it muzzled. As soon as the bloating has ceased to occur, increase the feed gradually, and observe meticulous care in cleanliness of the feeding pail and of the feed all of the time.

One ounce of cream at a feeding for a calf of this age may seem a starvation diet, and of course, it is, but the calf will get more nutrition from it than it does from a gallon of milk that it doesn't digest. It will probably be not more than a week until you can begin feeding it whole milk.

Two things in this would appear absolutely essential to success. Cleanliness and a gradual increase in the amount of feed from the one-ounce minimum with which you start.

In addition to this, the calf will require a very mild digestive tonic, and here again, care must be observed not to overdo the matter. Give the digestive tonic in a small quantity of warm water about one-half hour before feeling.

POKEWEED POISONOUS

A letter is received with a specimen of pokeweed, *phytolacca decandra,* which is sometimes called pokeroot. This plant is native and indigenous to large sections and has become naturalized in other sections. It has a large perennial root often 5 to 6 inches in diameter, with several branches. The plant attains a height of 6 to 8 feet, with numerous spreading branches and greenish white flowers; the berries are purple. The berries are used in France to color wines. They have a sweetish, nauseous, slightly acrid taste. The young shoots are used like asparagus, but they are injurious in a fresh state. The boiling evidently takes the toxic principle out of them. The root, too, is poisonous, slightly sweetish, but on prolonged chewing becomes acrid. It contains an active alkaloid, phytolaccin, and also the toxic substance phytolaccotoxin. Pokeweed is a violent but slow emetic, vomiting beginning after a few hours. It produces spasms, purging, and sometimes convulsions, and death is caused by paralysis of the respiratory organs.

Ames, Iowa. L. H. Pammel.

Although the cause of fowl paralysis has not been determined the dissemination of the disease is associated with the sale of eggs, baby chicks, and fowls for breeding purposes from flocks in which the disease occurs. —*Exp. Sta. Rec.* 59-8.

Observations on the Subcutaneous Crushing of the Testicular Cord in the Castration of Bulls*

By M. L. SOUQUERE, Lavardes, France

CASTRATION by subcutaneous crushing of the testicular cord is very old. It was known under the name of "martelage" or "talage" as early as the beginning of the last century. On account of the frequent failures, largely due to the crude equipment used, it never was extensively practiced. At present only a few empirics use this method in its primitive form in certain regions of Eastern France.

This operation appears, however, to offer many advantages. During late years it has been greatly improved, so that results are very satisfactory. Even earlier, Regianni and Colescus, then Burdizzo, lately also Eschini, have devised instruments which will crush the testicular cord without causing injury to the scrotal envelopes. At present the use of these instruments is becoming more and more general in France as well as in foreign countries. The society for prevention of cruelty to animals in Pretoria (South Africa) goes so far as to recommend this method because it is less painful than other methods of castration.

We have used Burdizzo's instrument (emasculatome) for several years and we can recommend this method of castration, results having invariably been commendable. At first we had difficulties to contend with. They were of such a nature that we consider it well worth the while to discuss these, as well as the methods adopted to overcome them.

The technic is very simple. Castration is done on the standing animal. While the operator holds the open pincers with one hand, the thumb and index finger of the other hand press the cord against the outer side of the scrotum and firmly hold it there. The open jaws of the pincers are then slipped over the cord; supporting one handle on the knee, the instrument is now rapidly closed until the cord is caught and somewhat compressed, so that it cannot escape. We then grasp both handles of the instrument with our hands and bring them together until the jaws are completely closed.

In practice, however the operation presents certain difficulties. The instrument as sold by the dealers often has handles that are a great deal too short, so that, when we meet with old bulls, it may be very difficult or even impossible completely to close the pincers. This defect can be remedied by making the handles longer. Burdizzo suggests to lengthen them by slipping over them two iron pipes, 12 to 16 inches long.

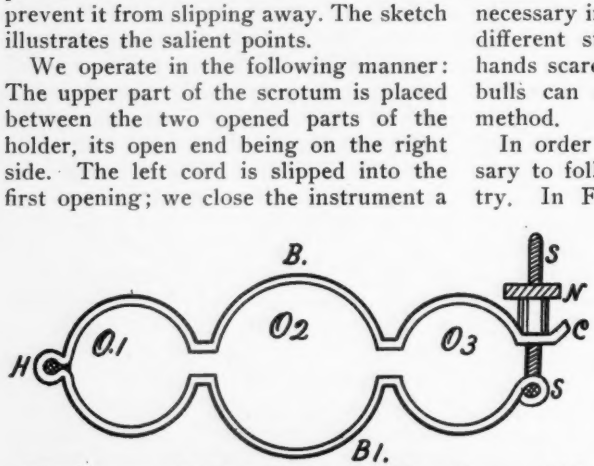
Another difficulty appears at the moment when the operator grasps the handles of the instrument and is therefore compelled to release the cord. The cord may then slip out of the jaws so that only the skin of the scrotum is bruised. This invariably occurs in the case of bulls that are over one year old, because the cord of such animals is very firm and elastic and too tough to be crushed by a sudden blow given to the handle of the instrument with the knee. This difficulty is avoided in the instrument made according to Eschini, which is provided with holders which fix the cords.

* Translated by C. H. Schultz, from Revue Vétérinaire et Journal de Médicine Vétérinaire—Official Journal of the veterinary colleges of Lyon and Toulouse, France, January, 1929.

In order to avoid this complication the makers of Burdizzo's pincers have made a number of modifications. Not one of these has given satisfaction. In some cases it is necessary to obtain an assistant, either to locate and hold the cord in position or to manipulate the instrument.

We have devised a very simple appliance which will confine the cord and prevent it from slipping away. The sketch illustrates the salient points.

We operate in the following manner: The upper part of the scrotum is placed between the two opened parts of the holder, its open end being on the right side. The left cord is slipped into the first opening; we close the instrument a little; then the right cord is slipped into the third opening. The two halves are closed and the open end is screwed down. At the same time as much of the middle part of the scrotum as is possible is pushed into the middle opening; the clamp is now adjusted and screwed down tightly. This will fix the two cords and hold them in the desired position.



Clamp for use with Emasculatome. H—hinge. B—arm which is prolonged so as to engage movable screw S and lock nut N. The end is forked so that the screw can slip in; it is also turned up to seat and hold the lock nut N. Arm—B1 carries the hinged screw S on which lock nut N can be screwed up or down. O1-O2 and O3 represent first, second and third opening.

Both hands are therefore free to be used in crushing the cord. The jaws of the instrument are placed over one cord *below* the holder in such a manner that they reach a little farther than the edge of the middle opening. The handles are then brought together. We then repeat the operation, applying the instrument again to the same cord, but *above* the holder which fixes the cords. After this we operate on the second testicle in the same manner. (Each cord is therefore crushed twice, once *below* and again *above* the holder! Translator's note.)

The operation is not complicated, it requires no tedious manipulations and no apprenticeship. It is a great deal less painful than bistournage. Besides it is clean. All the tedious manipulations necessary in bistournage are avoided; the different steps are so simple that the hands scarcely become soiled. Even old bulls can always be castrated by this method.

In order to obtain clients it is necessary to follow the customs of the country. In France it was at first rather difficult to introduce castration by bruising of the cord into districts where animals were usually castrated by bistournage. It is always easier to satisfy clients when an operation is carried out in a way with which the stockmen are familiar than when introducing a new method; it is a delicate matter to challenge the opinion of cattlemen. If they are familiar with castration by removal of the testicles and complications that may arise, they will at first be skeptical and may not accept your statements as to the simplicity, safety and dependability of the new method, even if it is carefully and properly carried out.

During the first months after castration by this method the testes remain in the lower part of the scrotum, some time is required before atrophy of the glands becomes marked. Later the cord contracts, then the testes are drawn well up into the upper part of the scrotum and become greatly reduced in size—atrophy is marked. The scrotal tunics were not injured and do not become thickened, inflammatory changes seldom develop. Fatty tissue usually begins to fill the scrotum. These conditions and after ef-

fects are characteristic and are acceptable to cattle buyers.

TREATMENT OF TETANUS*

The favorable results reported by Doctor Lheurre in Dakkar, obtained when treating persons suffering from tetanus with atropin sulphate in combination with tetanus antitoxin, led the author to treat horses afflicted with lockjaw in a similar manner, with atropin combined with the usual serum injections.

Six animals were treated. One, receiving injections of serum only, died on the fourth day. Of the other five, which were given anti-tetanic serum and atropin sulphate, three recovered and two died.

Doctor Didier states that treatment of tetanus in horses with sulphate of atropin, in combination with anti-tetanic serum, is well worth a trial.

1. The drug's action on the vagus appears to limit the progress of the toxin and to enhance the neutralizing effect of the anti-toxic serum.

2. The action of atropin on the medulla and the cord decreases reflex excitability, reduces congestion of the centers and affects the sudorific sympathetic nerve fibres, the action of which it modifies in man, but stimulates in the horse (according to M. Bru.).

3. It is not impossible that on account of its action on the heart, the contractions of which it accelerates, atropin has a salutary effect in cases of tetanus of long duration, especially when the patients are becoming exhausted on account of prolonged and severe attacks.

4. Finally the doses of atropin exhibited, 1 1/3 gr. to 2 gr., caused no deleterious effects on the secretory organs of the animals treated. Horses tolerate large doses of atropin, more than 5/6 of a grain per 100 kg. (220 lbs.) live weight. The author has never observed constipation.

We do not claim that in atropin sulphate we have a sure specific for the treatment of tetanus, but we believe that veterinarians have overlooked this remedy when called upon to treat such cases.

*Translated by C. H. Schultz, from abstract in Annales de Médecine Vétérinaire, November, 1928, Cureghem. Bruxelle.

COW'S MILK FOR HUMAN FOOD

Whether or not cow's milk, as compared with the milk of other domesticated animals, is nearest in composition to human milk, the development of the dairy cow has brought about the almost exclusive use of cow's milk as a substitute food for infants when artificial feeding, as an emergency measure, is unavoidable.

The milk of every animal is specially adapted to its offspring—varying with its average size, its rate of growth, and the length of time after its birth before other food can be taken. The difference in the chemical composition of cow's milk and human milk, therefore, is best explained by the fact that the calf doubles its weight in 47 days and the infant in 180 days.

Human milk has a little more than one-third the amount of protein in cow's milk and less than one-half the amount of mineral salts. The relative proportions of the different salts differ remarkably little, though the percentage of iron is said to be higher in human milk than in cow's milk.

The fat content and the size of the fat droplet vary greatly in milk from different breeds of cows, but ordinarily there is not much difference in average amount of fat between cow's milk and human milk. The percentage of sugar (lactose) is about twice as high in human milk as in cow's milk.

Dorothy R. Mendenhall, M. D.,
Washington, D. C.

AN UNRECOGNIZED PIONEER OF ANESTHETICS

At the annual dinner of the Royal Society of Medicine, the president, Lord Dawson of Penn (physician to the London Hospital), referred to an interesting discovery by Mr. Thompson, curator of the Historical Medical Museum. Mr. Thompson had shown that in 1825, preceding the introduction in 1842 of ether in the United States and in 1847 of chloroform in Scotland, a young physician named Hickman produced anesthesia by inhalation of carbon dioxide and nitrous oxide in animals, performed painless operations on them, brought his results to the notice of the English and French professions, and tried in vain to persuade them to institute the same anesthesia for man.—Jour. A. M. A., Vol. 92, No. 1.

Report of "Field" Investigations of Canine Distemper

By P. P. LAIDLAW, B.Ch., F.R.S., and G. W. DUNKIN, M. R. C. V. S.

A FEW years ago "The Field," a London sports publication, started a fund in England to investigate this disease. The work has been supported by public subscription and as is known to most American veterinarians, a considerable amount has been contributed to the fund by citizens of the United States. The committee published in "The Field" for Nov. 29, 1928, their eighth report of progress, and included in it a summary of all the work from the beginning of the investigation to date.

The report starts with a history of the disease and a short review of the literature of previous investigations. After a careful consideration of the literature, the investigators reached the conclusion that the weak point of the former work was in the test animals. That is, that it was impossible to tell whether an animal was immune or not and that many supposedly susceptibles had passed through light attacks of the disease and were immune to start with. One of their first procedures was to isolate their compound within corrugated iron fencing, with the kennels at one end and the living quarters for the attendants at the other. A rigid quarantine of everybody and everything entering the compound was kept. As an example, in order to enter, one had to pass through a small building, disrobe in the outer room, bathe in the middle and put on sterile clothing in the third or inner room.

Early in the experimental work, it was found, that the cause of the disease was easily destroyed with disinfectants and that an infected kennel could be rendered safe after thorough scrubbing and rinsing down with a disinfectant such as a 1% solution of lysol. The kennel being occupied again at the end of 24 hours.

Experimental Distemper

Distemper is a disease of so many different manifestations that it was thought at first that there might be several diseases to be considered but their experimental work indicates that it is a single disease and that immunity to one form gives immunity to others.

The symptoms of experimental distemper agree quite closely with those seen clinically but differ some as would naturally be expected. The incubation period is given as very constant at four days with a minimum of three days and a maximum of six days. The onset of the disease is sudden. There is fever and watery discharge from the eyes which may be very slight. Within 24 hours the eye discharge may be slightly purulent and the conjunctiva highly congested. The temperature quickly rises, up to 105 deg. F. or more, but subsides in one or two days and again soon rises. The second rise is slower and more prolonged. The dog usually vomits and has complete loss of appetite during the first rise of temperature. The appetite returns somewhat during the intermission but diminishes again during the second period of fever. Diarrhea is seen in most cases. It is more profuse in the second period of fever and may persist several days after the fever leaves. There may be slight cough and there is usually some evidence of respiratory inflammation but definite bronchitis and broncho-pneumonia are not seen.

The description for the nervous symptoms in experimental distemper coincides so closely with those met clinically that they will not be repeated. As we have found out clinically, nervous complications are always serious.

Mortality. The mortality from experimental distemper is slight although the dog is hit hard for a time. The low mortality is explained on the ground that there is less

trouble due to secondary invaders among animals kept in strict experimental conditions. This observation has been made by other investigators but is rather difficult for some of the clinicians to believe, but perhaps it is true. The results of the vaccinations tend to confirm it.

Infectious nature. It was found that the disease was highly infectious in the early stages of the disease, even before symptoms were manifest. The infecting agent was uniformly found in the nasal secretion and blood early in the disease but not always late in the attack. This is bad news for those who have charge of hospitals and shows, but it has been suspected if not known for some time. It simply makes it impossible to keep assemblies of large numbers of dogs free from distemper. There was evidence that actual contact was not necessary and that the infection might be carried short distances in the air in confined places.

The so-called skin form of distemper is not believed to have any connection with the disease since an attack of this trouble causes no immunity in experimental animals.

Distemper in Ferrets

Much of the work has been done by using ferrets for experimental animals. All important experiments have been confirmed upon dogs. The incubation period of distemper in the ferret is about 10 days, a little more than twice as long as in dogs. The symptoms of the disease in this animal differ somewhat from those in dogs but are very characteristic. These animals usually die on the 5th or 6th day of the attack. Any that survive are immune.

Nature of the Infecting Agent

Without going into a discussion of the work it is sufficient to say that the investigators agree with Carré that the infecting agent is a filterable virus and not bacterial. It is interesting to note that they did not encounter the *Bacillus bronchi canis* which was for a long time considered as the cause of the disease.

Immunizing Ferrets

A vaccine was made by grinding the spleen of ferrets sick of distemper in a sterile mortar and finally adding enough saline solution to make a 20% emulsion of the pulp. This was formolized up to 0.1% and the product was then kept under refrigeration for four days. Since any free formalin is irritant when injected, ammonia was added at the end of the attenuation period until the product was slightly alkaline. The immunization consisted of administering 2 cc. of the vaccine (the product described above) subcutaneously and in two weeks 0.25 cc. of untreated virus in the same way. Neither injection should cause any illness and the ferrets should be immune in another two weeks. They were able to immunize about 90 per cent of the animals in this way and the immunity persisted for months.

One difficulty was to obtain and standardize the virus. The ferrets have an incubation period of ten days; the material could not wait that long, so the vaccine had to be made and checked up later. The spleen gave the best vaccines but other organs could be used. The vaccine alone did not give lasting immunity. From three to five months after injections of the vaccine alone, some of the ferrets became sick and recovered, and in others the immunity had so disappeared that 50% died after an inoculation with untreated virus.

Immunization of Dogs

The preparations that gave such uniformly good results on ferrets were tried on dogs but in this case a single dose of vaccine did not protect against a dose of virus. Increasing the size of the dose did not help much. Three doses at weekly intervals

worked better although the dogs vaccinated in this way always reacted to the virus.

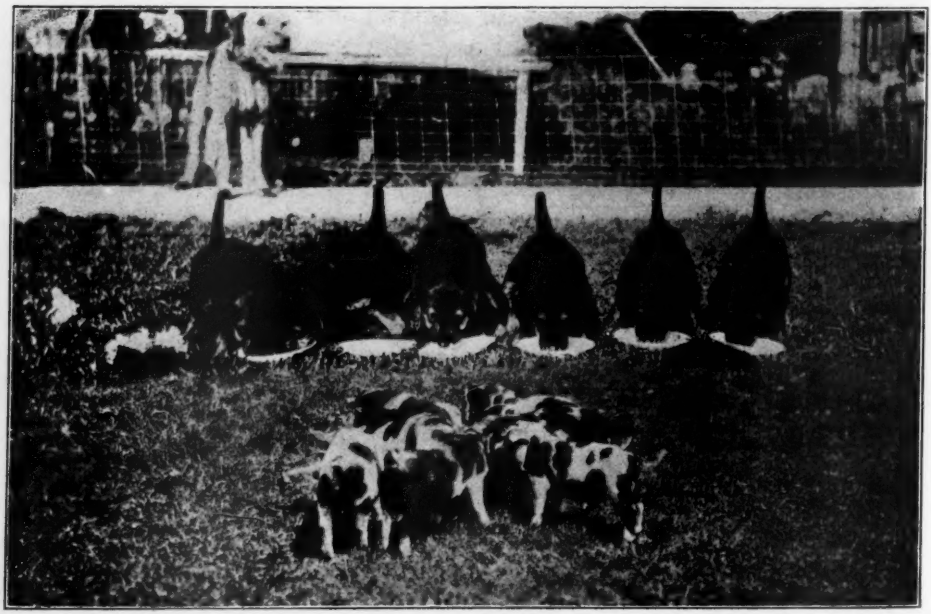
Results with dog vaccine. A vaccine from dogs was made similar to that described under ferrets. The spleen, abdominal lymph glands, liver, brain and some other organs were tried but sometimes a good vaccine resulted and sometimes not. The spleen and abdominal lymph glands invariably made a good preparation when taken between the 7th and 18th day following infection. There is difficulty in determining the right time to collect the material. The best vaccine was made when organs were used at the height of the disease. The authors feel that only experience in the preparation of several batches will determine which tissues to use. For example in the pronounced nervous forms of the disease a good vaccine can be made from the brain.

Method of administration. The vaccine is given subcutaneously, followed in 10 days with the virus. This method has been successful in field and laboratory trials. A virus attenuated by passing several times through ferrets is used in field work; a strong virus is used in the laboratory work.

From the point of view of future possibilities it is interesting to note that ferret vaccine did not work well on dogs and that dog vaccine was bad for ferrets. This points to the necessity of using homologous products and may justify the ones now on the American market.

Serum. The authors state that there is evidence that a potent serum can be prepared by hyperimmunizing immune animals but that the experimental work has not been completed. It is the hope that a product may be prepared and standardized so that virus and serum may be given simultaneously.

Results in field use. The material has been tried in many places and under many conditions. Sometimes not all the animals in a pack were treated and in some of these distemper broke out among the untreated but did not extend to the treated. In all 1330 dogs were vaccinated by 44 veterinarians. Among these were 325 couples of fox hounds. Many show animals were also vaccinated and some of them have visited shows and remained healthy.—H. J. M.



A General Survey of the Rabies Situation

By DONALD W. BAKER, Ithaca, New York,
Class of '29, New York State Veterinary College, Cornell University

RABIES has always held a unique interest for members of the veterinary and medical professions because of several important features of the disease. One of these unfortunate features is that practically all of the lower animals are susceptible, and that it is communicable to human beings. The more recent literature abounds with descriptions of cases in which the infection was transmitted by unusual methods. Mr. Menon,[1] Assistant Veterinary Surgeon of Negri Sembilan, has recently reported that in the village of Ancharakandy, British Malabar, a good many crows were showing symptoms of madness and were attacking people and that two women were undergoing Pasteur treatment in Telechery Hospital in consequence of having been bitten by one of these crows. It was thought that they had become infected as the result of eating the carcass of a jackal that had died of rabies.

When symptoms of the disease appear, there is no hope for recovery. The symptomatology is probably as well understood as of any other disease of man or animals, and methods for its extermination are also known but not easily applied in a large country. These facts are true of no other disease excepting possibly yellow fever. Although the symptoms of the disease and methods of control are so generally known, there has been a steady increase in the number of cases from year to year during the past five or ten years. For this reason it has come to be considered as one of the important public health problems. Although the number of deaths is not appalling, the suffering and fear caused by chance infections is such as to make it one of the most dreaded of diseases. During the past two or three years, there have been several surveys made of the rabies situation, both as a world-wide and as a national problem, and the greater part of the data and subject matter used in this paper will be drawn from reports of these surveys. Probably the most important single piece of literature on this subject is the report of the International Conference on Rabies,[2] which was held in April, 1928.

In order to discuss the latest information regarding the control and prevention of this disease intelligently, a brief resumé of the information regarding its etiology, distribution, history and symptoms will be given. Dr. V. A. Moore's definition of the disease is that it is an acute, specific infectious disease of animals and man. The latest information on research projects does not give much in regard to its etiology. It seems to be commonly accepted that the causative agent is a filterable virus, but there is some discussion as to whether it is a protozoon or a bacterium, and whether Negri bodies represent a stage in the involution of a living micro-organism or are produced by cellular action or degeneration. In textbooks where rabies is discussed, one finds the general statement that the disease is very widespread. In the United States, surveys have been made from time to time, but they were based on fragmentary data. In 1921, Seller[3] found that rabies existed in 29 states and that nearly half of over 5,000 heads examined that year were diagnosed as positive. In 1928, Rice and Beatty,[4] of Indiana, attempted a similar survey and found that rabies is

[1] Pauran (a Malayan newspaper) Apr. 14th, 1928.

[2] Tropical Diseases Bul., Vol. 24, No. 6, pp. 483-486. International Rabies Conference by A. C. McKendrick.

[3] Sellers, T. F., Status of Rabies in the United States in 1921. Am. J. Pub. Health, Vol. XIII, No. 9, p. 742.

[4] Rice, T. B., and Beatty, N. The Prevalence of Rabies in the United States and the World. Am. J. Public Health, Vol. XVIII, No. 4, p. 421.

on the increase in the United States. A comparison of the charts which were used to show the distribution of the disease in 1921 and in 1928, indicates that it has become much more extensively distributed than it was in 1921. Increases were reported from 24 states, of which New York is one. It is surprising that there are so few reliable records available when the seriousness of the disease is considered. The loss of stock and expense incident to treating man and animals must run the expense account of this strictly preventable disease into many millions of dollars per year.

Rabies is an ancient disease. Lubinski and Prausnitz of Breslau, in their precise account of rabies, published in 1926, state that the first reliable description of the disease among dogs is found in a report by Aristotle (B. C. 322) who was familiar with the spread of rabies from dog to dog by means of bites. It was introduced into the United States about the middle of the Eighteenth Century. The first cases were reported from the northeastern part of this country, and it has been gradually spreading south and west until at the present time the Atlantic seaboard, southern states and Pacific coast, are the most heavily infected.

The usual symptoms of rabies are known to all veterinarians and will not be discussed in detail here. Symonds[5] in his article, "Rabies in the Lower Animals," shows that there is a considerable variation in symptoms and that many cases are of the type intermediate between the typical "furious" and "paralytic" forms. The furious type is not common and the ordinary idea that the infected animal is always a savage beast, rushing madly about, frothing at the mouth, and attacking anything and everything that it meets, is erroneous. As a rule most of the dogs affected seem to want to wander off quietly and be left alone. Although symptoms may differ with cases, there seems to be a general similarity about the course and progress of the disease. It is a progressive one and should be diagnosed by no single symptom but by the chain of symptoms and the course. Usually it is impossible to see the case from the beginning, when it becomes necessary to rely upon a laboratory examination to furnish a definite diagnosis. A differential diagnosis of rabies from such other conditions as epilepsy, injuries, and tumors in the brain, can usually be made from the history of the case and examination of the brain. There are many conditions which exhibit symptoms simulating rabies which are caused by other agents.

Symptoms of frenzy or convulsions may be set up by foreign bodies which are in the alimentary canal or have become wedged between the teeth. Ascariasis in pups, and even obstinate constipation may have similar results, and the often mentioned bone in the throat is frequently to be differentiated from rabies. Stanhope[6] records one case in which the owner had shot his dog as a suspected rabid animal because of its having had a couple of frenzied fits. On postmortem a large pear-shaped lump of coagulated latex completely blocked the pylorus, and examination of the brain proved negative. Fracture or dislocation of the lower jaw may be mistaken for "the dropped lower jaw" of rabies, especially since these cases are usually accompanied by an increased salivation. Any dog brought to a clinic for treatment and showing an indefinite dullness, loss of appetite, stiffness or tenderness along the back or of the hind quarters, twitching or slight apparent paralysis of the hind legs, unless definitely diagnosed, should be kept in mind during the next four or five days as a possible case of rabies.

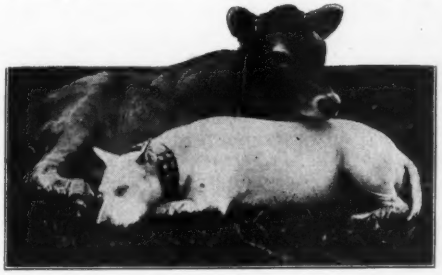
Some writers, notably Stanhope,[6] believe that the period of incubation may stretch over a year or more and that the average time is six months. It is often impossible to get credible histories on

[5] Symonds, S. L., Rabies in the Lower Animals, Bul. 1 of 1925, of the Institute for Medical Research, F.M.S.

[6] Stanhope, R. A. B. Rabies in Malaya. The Veterinary Record, Vol. VIII, No. 47, Nov. 24, 1928.

successive cases, and I believe that the longer periods described result from a lack of checking up on the intermediate cases. Certainly so far as one may judge by the history many cases develop about the 35th day after inoculation, with of course cases developing earlier and later but seldom before the 14th day and infrequently beyond the 60th day.

The control or eradication of the disease is its most important phase, judging from the amount of space devoted to it by every reference which I have consulted. In England the disease was stamped out in 1902 by the energetic action of[7] "ordering and enforcing that no dog should be allowed out of doors except when muzzled or under proper control, the institution of a six months' period of quarantine for all imported dogs and the destruction of stray dogs." This procedure would probably operate as effectively in the United States if it could be enforced. The usual control measure here is to enforce strict quarantine within a limited area, following an outbreak of the disease. Since it is common knowledge that the infected dog may travel for long distances, this procedure would seem to be ineffective, and it has so proved. During the past few years, or since the two Japanese investigators, Umeno and Doi,[8] in 1922 reported the use of a vaccine as a prophylactice for the disease, there has been increasing interest in its control in this country by immunization against it. Umeno and Doi produced their vaccine by keeping an emulsion of the nervous tissues of a rabbit, dead from a fixed virus, in a mixture of glycerol and phenol for two weeks at room temperature. In the dog this vaccine is to be used as a single injection of 5cc. subcutaneously, and the immunity produced lasts for one year. Eichhorn and others claim that remarkable success has attended all of the vaccination work in this country. Probably the best controlled experiments have been carried out by Schoening of the U. S. Bureau of Animal Industry.[9] The results of his experiments seem to prove that there are two or more strains of rabies virus and that immunization against one strain does not protect against the other. He brought out another important point against the use of the virus by reporting that a vaccine prepared according to the method of Umeno and Doi was not innocuous for dogs. He reports the development of paralysis and death of a dog as a result of vaccination. Barnes[10] of the Pennsylvania State Bureau of Animal In-



dustry reports a case in which 30 hound dogs were vaccinated by the single injection method, and that during the next 12 months, 9 of these dogs died and were diagnosed on laboratory examination as positive cases of rabies. MacGregor,[11] a British veterinarian in the Malay States where rabies is quite prevalent, reports that he commenced to vaccinate in 1926. He had been instructed by the Institute of Medical Research that vaccination would very likely prove to be a sufficiently successful prophylactic which would supercede muzzling orders and render them unnecessary. He states that from his experience, vaccination as a prophylactic has not proved successful

[7] Encyclopedia of Vet. Medicine, Surgery and Obstetrics, Vol. 1, p. 169.

[8] Umeno, S., and Doi, Y., A Study of the Anti-Rabic Inoculation of Dogs, and the Results of its Practical Application, Kitasata Arch. Exp. Med., 1921, Vol. IV, p. 89.

[9] Schoening, H. W., Experimental and Field Results of the Single Injection Canine Rabies Vaccine. Cornell Veterinarian, Vol. XVIII, No. 2, p. 105.

[10] Barnes, M. F., Discussion of Paper by Eichhorn. "Present Status of Rabies." J. A. V. M. A. Vol. LXVI, No. 1, p. 195.

[11] MacGregor—quoted by Stanhope—Rabies in Malaya.

and that he will continue to put his faith in older methods. Eichhorn explains the failure of the vaccine in the foregoing cases on the grounds of substandard quality and insufficient quantity. Until recently there has been no uniform standard of quality or quantity of the dose in the antirabic vaccines (or bacterins) on the market. Probably upwards of a million dogs in the United States have been vaccinated against rabies. There have been almost no reports of such dogs contracting rabies through natural infection.

Apparently there is no agreement on authenticated data that vaccination, short of a full course of Pasteur treatments, such as is given to human beings, is reliable if given after the animal has been bitten by a rabid animal. The Fourth Committee of the Paris International Conference discussed the prophylactic vaccination of animals and their conclusions are reported in the Tropical Disease Bulletin, Vol. 24. Briefly summarized, these results are to the effect that the conference could not recommend any change in existing sanitary legislation; prophylactic vaccination of dogs should be continued and the dose repeated yearly; and that any suitable cases should permit of some relaxation of regulations subject to the following measures: viz., that all dogs bitten by a proved rabid animal should be destroyed, even if previously vaccinated, and dogs when suspected of having been bitten should be vaccinated and kept under isolation for six months. Prophylactic or curative vaccination of cats should never be employed. The report of the Conference concludes with the statement, "In the opinion of the Conference the only measures that will completely eradicate rabies are, the restriction of the liberty of the dog, unless muzzled, to the premises of the owner and the destruction of the ownerless dog."

The writer believes that rabies could be entirely eliminated from this country if the measures for control as enumerated in the preceding paragraph were rigidly enforced by the police forces in our cities and states. His experience in the Diagnostic Laboratory of the New York State Veterinary College during the past three and one-half years, where the heads of suspected rabid animals from the State, outside of New York City, are examined, would lead him to believe that an outbreak of rabies is usually brought under control in a limited area in a short time. However, it would seem that at least one infected animal eludes the officers and within a short time we are informed of another outbreak in an adjoining district. England has demonstrated that control of movement and the muzzling order eradicated rabies. In England practically every dog has an owner and is licensed; pariahs are practically unknown and the local police force is a large one and capable of effectually enforcing orders. The situation is quite different in this country and generally throughout the world. Muzzling and restriction of movement has seemed impossible of being effectively carried out.

After reading several references about rabies, one feels sure that there is still a great opportunity for research on this disease. The several things which might be investigated are: (1) the nature of the virus, (2) whether the street virus encountered in certain countries is an attenuated form as thought to be in South Africa, (3) period of incubation, (4) resistance of the virus under natural conditions outside the body, (5) improvement of methods of vaccination, and (6) practical dosage.

One very interesting suggestion which was encountered was that of the possibility of a vaccinated dog being able to harbor the infection without developing typical symptoms, but capable of infecting another dog. Stanhope[6] reports a case in which a young puppy which had not been born at the time the last case in that locality was diagnosed, but which had developed the disease, was known to have been bitten by another dog which appeared quite well at the time and for some months afterwards, but had been vaccinated.

Similarity of "Black Tongue" and Infectious Hemorrhagic Gastro-Enteritis

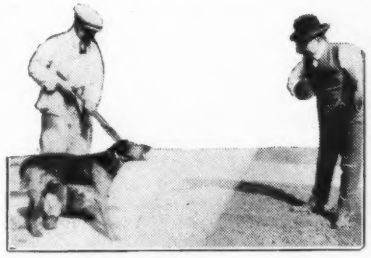
By ALEXANDER GLASS, Philadelphia

RECENTLY certain observers have made some very interesting experiments on this condition. First, Goldberger, then Underhill and Mendal, have done considerable research work, and while their summary of results does not entirely agree with the observations of the writer, in the main they do coincide.

For a number of years the writer has had under observation cases of dietetic deficiency that are very similar to those described by Underhill. The condition is a familiar one, particularly in the Southern states of the Eastern Coast, and where large numbers of dogs are kept for hunting purposes (pointers and setters). It is generally found in over-crowded kennels with insanitary surroundings, kennels that have been used for years with no changes or systematic digging and turning of the ground. Particularly is it seen where animals are kept on a single diet without variation, such as cornmeal (ground maize) and straight meat, and in packs of hounds where straight meat alone is the single diet.

The symptoms presented in such cases are very irregular, especially where a large number of animals are kept together. Generally we find ulcerative stomatitis and acute necrosis of the mouth, with actual sloughing of the periosteum, and in other cases of death without any external manifestation, we find only numerous petechial spots on the lining of the intestines, and also on the conjunctival mucous membrane. Some outbreaks are characterized by great hematomas, particularly in the region of the cervical and sternal region. These contain a mass of dark blood, sometimes partially organized in the cellular tissue, and, in some instances, liquid. In the writer's cases no fluid resembling pus was ever found.

A typical case begins with increased redness of the mucous membrane of the mouth quickly followed by ulceration, particularly on the buccal membrane. In some cases yellowish patches appear which soon suppurate and present an ulcerated surface. There is a very offensive breath, similar to the odor of dead bone tissue; great depression, a rise in temperature (although often a subnormal temperature is present); staring coat, the animal giving off a very offensive odor; generally diarrhea with dark stools. The depression quickly changes to coma, in some cases mild, continuous convulsions, and death.



A case of dumb rabies. Years ago black tongue was often confused with dumb rabies. The man on the reader's right is Dr. C. A. Zell, Chicago.

This condition is rarely observed in the house pet, or where only one or two animals are housed together, but invariably in large kennels or packs of hounds.

The nutritive deficiency observed by the writer is a want of green food in the diet; in other words, a deficiency in chlorophyl; hence the administration of some green vegetable and, in some cases, milk alone, either sweet or sour, produces immediately a change for the better.

As a preliminary measure all cases that seem hopeless should be destroyed and the bodies removed far away from the kennel. The best plan, and one that should always be followed is to find the nearest mill or furnace and cremate the bodies there. Build-

ing a local fire is not desirable since, unless carefully superintended, the average workman leaves charred bodies, half consumed.

Healthy animals or those slightly affected should be immediately removed to some new location, on new ground or to a barn where other species of domestic animals have been housed. Broths and stews with a large content of greens of all kinds should be prepared to take the place of the former diet. Dandelion roots and leaves seem to have a very pronounced corrective effect. Indian corn (maize) in any form should be avoided. Large quantities of milk with stale bread or other cereals, cooked macaroni and tomatoes may be given.

To illustrate the effect of apparent deficiency of greens: In one large pack of dogs the males began to die rapidly, displaying all the symptoms mentioned above, while the bitch kennel showed no cases at all. Upon questioning the kennel man, it was found that while the males had been fed exclusively upon boiled meat (cow) and corn meal during a period of three months, the bitches alone during that time had been given the entire intestinal tract of the cows together with the contents, and, as he described it, they "ate the inside as well as the tripe." This may further tend to the belief that something green in the diet is essential. We feed our dogs, as a rule, entirely too much meat and not enough of the vegetables and starches in proper ratio.

The latter statement is very apt to bring a smile from the general practitioner, who remarks "The dog is pure carnivora; teeth and stomach clearly indicate that." This is true in every sense, but where do we find a true dog, as nature developed the wild dog, or dingo? The dog of the present day is a very artificial creature. He retains his carnivora teeth and stomach, but we have bred him large and small, close-coated and long-haired, long-legged or crooked-legged, white, black, brown, tan, the head of a bulldog, the nose of a borzoi, etc, etc. Today there is no domestic animal that has been so altered from his original ancestor as the dog. He is not a carnivora, but his long association with man, from the caveman down, has made him an animal who eats what man eats, an *omnivora,* and his diet should be meat, vegetables, wheat and other cereals, one-third of each in just proportion. For what is more pathetic than the meat-fed house pet, lazy, habitually constipated, smelly, with eczema on the back and in the axillae, and perpetually scratching?

W. Reid Blair (at left), curator of the New York Zoological Gardens. The photograph was taken when Dr. Blair was veterinarian to the Zoological Gardens.

Black-Tongue in Dogs*

By H. CALVIN REA, Charlotte, North Carolina

BLACK-TONGUE in dogs constitutes one of the greatest problems of the small animal practitioner in the Southeastern States. The very fact that a vast majority of dog owners are of the opinion that it is invariably fatal, places a greater responsibility on the veterinarian. There is much educational work to be done regarding this as well as other diseases in our field of endeavor. While attending meetings of our various associations within the past eighteen months, I have asked numerous veterinarians the following question: "What per cent of black-tongue cases recover following your treatment?" Not one has attempted even an approximation. Is it strange to you that so many cases go untreated when we fail to give our clients and prospective clients information regarding this disease?

I shall not attempt to review the theories of the nature, etiology and pathology of black-tongue, because they are not definitely known. We do know it occurs in dogs which have been fed a low percentage of meat. However, we have a similar history in certain diseases that are known to be due to a specific infection.

Even though this disease has been known since 1850, we are unable to find a very comprehensive description in any of the present-day text books. Very little has been published in American literature regarding this disease. You are doubtless familiar with the investigations of Underhill and Mendel of Yale University. The experiments of Goldberger and associates (which includes your Secretary) reported in U. S. Public Health Service (January 27, 1928, and March 23, 1928) are probably the most complete published to date. They conclude as follows: "The black-tongue preventive and the pellagra preventive are both present in yeast. Taken in conjunction with certain other evidence pointing to the fundamental identity of black-tongue and pellagra, this association strengthens the probability that the black-tongue preventive and pellagra preventive or vitamin P-P are identical."

Differential Diagnosis.—Under differential diagnosis, the symptoms of black-tongue are pathognomonic in the majority of cases. Stomatitis caused from hot feed, irritating chemicals, mechanical injuries, etc., are not very confusing. However, there is a small percentage of cases in which the buccal lesions are absent. The clinician's ability is taxed in these cases. He must differentiate between purely digestive disturbances and black-tongue. The most characteristic symptoms of these cases are emaciation and a profuse bloody diarrhea. In these cases black-tongue does not produce such great temperature variations as do those of a digestive origin of equal severity. The temperature reading in black-tongue usually ranges between 98 deg. F. to 103 deg. F.

Symptoms.—The more pronounced symptoms of black tongue are: Sudden onset, loss of appetite, vomiting, anemia and emaciation, injected conjunctivae, staggering gait, increased thirst, from a slightly reddened buccal mucosa to a marked necrosis, which first appears inside the upper lips, cheeks and floor of mouth. Temperature in the beginning 103 deg. F. to 106 deg. F.; later dropping to normal, then sub-normal. The pulse is rapid and weak; the respiration accelerated and seemingly painful; there is drooling ropy saliva usually stained with blood and a very characteristic foul odor is noticeable. Erythematous patches may be noted in various places, notably the scrotum. Occasionally a shifting lameness is present. In the beginning most cases are constipated, but later develop a profuse bloody diarrhea. A small percentage of cases develop a tonic type of convulsion and such cases invariably die.

Nursing.—Nursing is an important factor in the treatment of these cases. It determines the outcome of a great many patients. San-

*Presented at the Annual Meeting of the Southeastern States Veterinary Medical Association, Chattanooga, Tenn., Feb. 15-16, 1929.

itary measures, of course, should be very carefully observed. The patient should be given access to a small run, which is well shaded and equipped with an elevated kennel. Regardless of the weather condition, he should not be allowed to lie on the damp

ground. Prior to June 1928, except in cases with an acute gastritis, we gave them free access to water. Since that time we do not give them water for 72 hours after they are in our hospital. Our experience, of course, has not been sufficient to justify a positive statement, but we are of the opinion that it is a wise procedure to withhold water at the beginning.

Diet.—Fresh, finely ground, raw beef muscle supplemented occasionally with canned salmon, we consider the best feed for the affected animal. After improvement is evident, vegetables are gradually added until they constitute about 20% of the diet. From three to six No. 11 gelatine capsules of dried brewer's yeast are given daily. Occasionally we have given predigested beef with questionable results. The vegetables selected are carrots, lettuce, turnip salad, onions, tomatoes and cabbage.

Therapeutic Treatment.—Any of the non-irritating, non-toxic antiseptics may be used to an advantage. We employ neutral acriflavine solution 1-1000 poured into mouth, some of which the patient is allowed to swallow. Five-grain ichthyol tables are given three times daily. In great depression, hypodermic injections of camphorated oil are used as a stimulant. These cases do not tolerate strychnin. We are now using in addition to the above treatment carrotin in glycerin, as to the value of which we are unable as yet to give an opinion.

Results.—A brief review of the results of cases treated in our hospital from August 1, 1927, to July 31, 1928, did not materially differ from our experience prior to that time, except that brewer's yeast was added and the mortality rate decreased by approximately 10%, which brought it down to 30%. We keep exact records on these cases and every client is given this information when his case enters our hospital. Incidentally, it seems significant to us that 97% of the fatalities under our care succumb prior to the fourth day.

Autopsy.—Severe inflammatory changes in the digestive tract are very pronounced. The mucous membrane in stomach is greatly swollen. The small intestines are ulcerated and present numerous hemorrhagic areas. The peritoneum over the stomach and intestines is injected. The mesenteric lymph glands are enlarged and show acute swelling. The liver and kidneys are hyperemic, lungs edematous.

Conclusion.—Our mortality rate is, as you can readily see, entirely too high. If we are correct in assuming that we are dealing with a dietary deficiency, we feel that the methods of treatment described herein must be materially modified. Most cases are well advanced when we get them. The lesions present in intestinal tract must result in impaired function; therefore we conclude that the curative agent, whatever it happens to be, must necessarily be administered intra-muscularly or intravenously.

Treatment of Caged Birds

By W. J. RATIGAN,* New Orleans, Louisiana

IN THE larger cities especially, birds, kept as pets, are brought to the small animal hospital for treatment. The most common of these are the various canaries, parrots and their cousins parrakeets or love birds, macaws, mocking birds, red birds, etc. A few times a crow has come to us.

The conditions we are called upon to treat in these patients come under three general heads:

1. Diseases of the respiratory organs.
2. Diseases of the digestive organs.
3. Injuries.

Canaries, especially singers, seem for certain obvious reasons to lead in respiratory and circulatory disturbances and the parrot family in digestive diseases.

Some members of all the bird families, especially caged ones, suffer from the effects of deficiency conditions. Skin diseases are not common and more often than not are associated with deficiencies of diet.

Fracture of the bones other than of the legs are not common. The only fractured wings I have seen in either canaries or parrots, numbering but three or four as I remember, were broken maliciously by unfriendly neighbors. The only fractured limbs I have seen in a parrot was a case in which both legs as well as the wings were broken because the parrot disturbed a neighbor's sleep.

Organic diseases of the brain, as I find them, are very rare. The convulsions I have observed in birds are, as a rule, autointoxications brought about by faulty foods, or occasionally by worms.

Handling Birds in the Hospital. When the birds, especially canaries, are brought to the hospital one should have the cage or box placed upon the examination table for a few minutes before uncovering it. Usually a cloth is over the cage or the bird is in a pasteboard box. Let the owner remove the bird. I remember a canary bird, not very sick, dying of fright when taken from its box by the veterinarian's assistant. While the owner is busy with the bird, observe the food that has been fed—pick up some of it and examine it closely. See what sort of seeds are being fed. These birds should be fed according to season. In singing canaries, for instance, a little hemp seed during warm weather will often cause them to stop singing. See, too, that the seeds are sound and contain nourishment. Cheap seeds are often devoid of much other than the shell. Don't forget to see to it that gritsand has always been kept on the floor of the cage. (The Louisiana State Conservation Department often sends me ducks during the shooting season to autopsy, and I know of thousands dying because of their inability to find shells way down along the coast where shells are abundant).

Don't forget that people who don't know any better will often attempt to feed soft-billed birds, like the mocking bird, hard seeds. They should be fed the prepared mocking bird food which usually contains ground seeds, various oils, and meats. Some owners even grow worms in wet bran for these birds; dried worms and insects may be bought in packages and prepared for soft-billed birds.

On autopsy one can see the reason for the difference in foods for a canary and for a mocking bird. The birds that consume hard seeds are possessed of a strongly muscled stomach or gizzard with considerable cartilage in its make up. The worm and meat eating birds have a stomach more like a carnivorous animal and gastric juice is secreted that takes the place of the grit used in the other type of stomach. After going into the food thoroughly, inquire where the bird has been kept, if there have been any unusual noises or anything to annoy or worry it. (This applies more to other birds

*Doctor Ratigan died suddenly of Influenza, January 11, 1929, just a few days after sending this article in for publication.

than to parrots.) Often in the examination, the owner's statement or a glance at the patient will disclose the nature of the ailment. The number of very sick birds that will recover if given proper attention is remarkable.

The drugs used are few and they suggest themselves. Metagen in the drinking water or sometimes mixed in food is helpful in some deficiency conditions as is cod-liver oil food. When drugs are given, give harmless ones. During molting all birds must be well cared for and carefully fed.

Fractures

The following applies to the treatment of fractures in canaries. For larger birds this method can be modified readily to meet the altered conditions.

Many canaries are brought to my hospital with fractures of the tibia and tarsometarsus, occasionally the tarsus itself is involved. Fractures of the femur are very rare. Fractures are treated as follows:

1. The bird is held by an assistant who holds the wings over the back with the index finger between them so as not to make the patient more uncomfortable than necessary.

2. A light artery forcep is attached to the very tip of the middle nail. This extends the limb which is usually held tightly flexed against the body.

3. The feathers are pushed up out of the way in the higher fractures, say the middle or upper third of tibia.

4. Around the fracture, a third to half an inch above and below it, is painted with flexible collodion. After a moment a second coat is applied and in the same manner several coats to build up around it and hold the bones or pieces of bone in apposition.

5. A little absorbent cotton is wiped around the collodion to give the surface a little roughness. It also increases the tensile strength.

6. A small piece of tin foil similar to the kind used in small ointment tubes is shaped to fit snugly around the portion treated and it is gently placed around and carefully tooled, one flap over the other with a pair of small sharp pointed artery forceps.

7. The bird is placed in a cage without swings or perches. Food and water is placed on the floor of the cage.

I have had some fractures where only a small thread of tissue was holding the distal part to the limb and have in these cases kept the cast on one month. As a rule two weeks is enough. We charge five dollars for this cast, whites and blacks have never questioned the price. The bird of course is kept at home.

We average one of these cases a week, year around, and I have never had an assistant who knew how to start to treat these fractures in little birds until he learned this simple method. Lots of sick and injured birds come to my hospital and it is not unpleasant work, paying as much as dog and cat work.

The Care and Treatment of Primates (Monkeys) in a Zoological Park

By CHAS. V. NOBACK, New York City

THE object of this article is to give a few practical suggestions on the care of primates, based on experience gained in a zoological park.

The animals popularly called "monkeys" properly belong to the Order of Primates in the Class of Mammalia. The information in this article is neither new nor entirely original but is based on the practical experience of those who have charge of this group at the New York Zoological Park. It would appear that this information might be of some assistance to practitioners who may be called upon for advice in connection with private or public zoological collections and research laboratories.

With the possible exception of the Japanese red-faced monkey, all primates naturally inhabit the warmer parts of the earth where they live outdoors, usually among trees, in an environment of pure air and sunlight the year round. They have a wide range, traveling in large or small groups in accordance with the characteristics of the species.

The primates may be roughly grouped as follows:

1. Man-like (or anthropoid) apes, which are confined to three relatively small areas of the earth, namely, the orang-utan of Borneo and Sumatra, where they are quite prolific; the chimpanzee and gorilla, found in the Belgian Congo and French Equatorial Africa. The gorilla is the largest of the apes, attaining a height of about 5 feet 8 inches and a weight of 400 to 600 lbs. The gibbon is confined to Siam and southeastern Asia and the Malay Peninsula. The apes are all tailless.

2. Old World Monkeys (Cercopithecidae). These are confined to southern and southwestern Asia and most of those which come to the United States are the common *Macacus rhesus* of India. There are no primates indigenous to Europe with the possible exception of the Barbary ape—a macaque found at Gibraltar and which is said to have been brought there by the Moors. A great variety of primates come from Africa, those most commonly seen in the United States being the so-called green monkeys, white-lidded mangabeys and the lemurs, the latter coming from southeast Africa and Madagascar. A characteristic of the Old World monkeys which may aid in differentiating them from the New World monkeys is that the Old World monkeys as a rule do not have a prehensile tail, while New World monkeys do. Those with prehensile tails are frequently called ring-tailed monkeys.

The sources from which these animals may be obtained are usually wild animal importers, or dealers in various kinds of pet animals. These dealers obtain isolated specimens either from sailors or travelers who enter our ports, or they buy them from professional animal collectors who make trips to the Straits Settlements, Borneo, Sumatra, India and various parts of Africa.

Monkeys obtained by natives in their natural habitat may be and usually are in excellent physical condition when captured. When collectors obtain a few animals from different regions and finally herd them together before shipping it can readily be seen that outbreaks of parasitic infestation and infectious diseases are inevitable as carriers serve as centres of infection. Many of the natives are also carriers of various intestinal parasites. Dealers frequently suffer heavy losses at this point and still greater losses are encountered among the survivors on board ship in course of transportation. On their arrival at a port like New York they are then taken to one of several wholesale dealers who have well-equipped stations, such as small barns or sheds, where the survivors

of the trip are kept. The more hardy specimens are kept and for want of a better term are "acclimatized" to their new environment.

The chimpanzees and orang-utans are the more hardy of the large apes and as a rule are soon acclimated, their diet being similar to that given to a child. The gorilla, the largest of the apes and said to be closely related to man, does not survive very long in captivity. None have been raised to maturity. They may live from two weeks to not more than three years. The one that lived longest was kept outdoors on a private estate near Miami in Florida under conditions closely resembling its native habitat. It is forbidden to remove gorillas from the Belgian Congo where a reserve has been established at the suggestion of the late Carl Akeley. The writer recently autopsied two specimens belonging to dealers, one of which died soon after arrival of an acute bronchopneumonia, having been treated for a bad cold by the owner. The second had been in the country for about eight months and seemed to be doing well, weighing about 30 lbs. It also suffered from a "cold" and on autopsy lobar pneumonia was found. The gibbon is also very delicate and does not live long in captivity.

The rhesus and the macaques of India are imported in large numbers and are quite hardy. This is one of the species of monkey used for experimental work in various research laboratories, and at times is kept as a household pet.

The Central and South American monkeys, frequently known as ring-tailed monkeys on account of their prehensile tail, are also frequently found for sale by animal dealers in the larger cities.

It might be well to call attention to the fact that none of these animals survive very long as household pets except under exceptionally favorable conditions, when the expense for the care and keeping of them can be borne by some wealthy owner. It is advisable to discourage the keeping of them as pets as amateurish attempts to take care of them virtually amount to cruelty to animals. Even the most carefully planned and managed zoological collections leave much to be desired in approaching the natural conditions for these animals.

The following conditions are some of the fundamental requirements which must be fulfilled before it is attempted to successfully keep any of the animals belonging to this group. They apply to the keeping of one animal or a collection of them. All are equally important regardless of the order in which they are presented.

1. *Space.* Plenty of room is needed for them and provision should be made for trapezes, swings, or a tree placed in a cage so as to provide some means for exercise and play. If confined too closely it will not be long before they will develop digestive troubles which may end fatally.

2. *Temperature.* The ideal temperature for these animals is between 65 deg. and 72 deg. F. It is important to keep the temperature even and not have wide fluctuations, especially during the winter weather (in the latitude of New York City). Sudden drops in temperature bring on chills. While there are hardy species which might stand low temperatures, like the Japanese red-faced monkey, it seems advisable, from our experience at the New York Zoological Park, that a steady, even temperature is more desirable. Some zoological gardens on the continent provide or allow their monkeys to have access to outdoor cages during the winter but have a warm cage indoors.

3. *Ventilation.* Provision must be made for proper ventilation as pure fresh air is absolutely necessary at all times to keep the animals in good condition. This may seem obvious but it is pathetic to see the condition in which these animals are kept at times, when housed in small filthy boxes with little or no change of air. It is of extreme importance to bear in mind that contact with human beings should be limited to keepers known to be free from open tuberculosis. In public zoological collections it is advisable to have a one-half inch to one inch wire mesh screen placed several feet in front of the cages to prevent fine sprays resulting from sneezing or coughing by visitors from reaching these animals. The screen also serves to prevent undesirable objects from being thrown to the animals.

4. *Dryness.* The floors of the cages should be dry and clean at all times. The floor should not be made of wood but of a composition cement which will not become soaked with the excreta. Experience has shown that hay makes a good covering for the floor in that it takes up the moisture and semi-solid fecal matter and can be removed easily daily, thereby removing the eggs of various intestinal worms with which some of the monkeys may be infested.

5. *Light.* The importance of natural sunlight during the spring and summer months in our latitude is of vital importance in keeping the anmials in good condition. The ideal is to have outdoor cages accessible to a good supply of sunlight. It is interesting to see these animals bask and sleep in the sunshine, apparently instinctively realizing its value. Access to sunlight in the spring "brightens up" the hair coat after winter confinement. During the winter months the advantages of sunlight are limited since the winter sunlight in our latitude is said to have a poor supply of the beneficial ultraviolet rays. This deficiency can, however, be overcome by using foods containing an adequate amount of the vitamin D as found in the yolk of eggs, good milk and cod liver oil.

Direct irradiation with light from mercury vapor lamps and carbon arc lamps has been used and found of some value in the treatment of a few cases of rickets at this Park, yet an indiscriminate use of this lamp should not be encouraged because a properly arranged diet will prevent rickets. We have found that the feeding of whole dried milk which has been irradiated for one-half hour at a distance of one foot by a standard mercury vapor lamp may be used as an aid in preventing rickets.

7. *Food.* The problem of properly feeding the animals in this group is not a simple one for monkeys need as wide a variety of food as human beings in order to fulfill all the known requirements as to the quantity and kinds of proteins, carbohydrates and fats together with the needed mineral matter as calcium phosphate, iron, etc. Further, as is known by veterinarians in general the necessary foods containing the so-called "food accessory factors" (vitamins A B C D E, etc.) must be provided in order to prevent the development of various deficiency diseases, particularly scurvy and rickets. Many of the food requirements of these animals have been known empirically by those in charge of this group, as will be seen from the following list of foods which serve as the basis for making up their rations.

Milk. The use of diluted condensed milk is recommended because these animals seem to tolerate it better than pure cows' milk and the danger of intestinal infection from contaminated fresh milk is minimized. In order to insure against the development of rickets the practice of incorporating irradiated dried milk has been adopted at this Park. This form of dried milk may be obtained on the market, thus obviating the necessity of the purchase of one of these lamps.

Eggs. Fresh eggs may be boiled and then fed after being finely chopped, or incorporated in the milk in the form of an egg nog.

A mixture of two-thrids dried bone meal and one-third dried blood meal can be used to supply some of the mineral requirement. For small chimpanzees from one-half to one teaspoonful daily is sufficient. This requirement may be supplied by the use of other reliable mixtures of this type.

Bananas are one of the staple foods and it is interesting to note that some monkeys, particularly the apes, like the chimpanzees and orang-utans, are very fond of the inner white layer of the skin, at times preferring it to the banana itself.

Lettuce. Fresh lettuce is needed about three times a week to supply green matter. In summer when leaves are available, young maple, oak, grape and wistaria leaves can be used in place of lettuce. This change is greatly relished by the monkeys.

Boiled potatoes with their skins on are relished, are good to feed at times, alternating with bananas.

Oatmeal, together with prunes, dates or figs, are desirable about once a week.

As some of the smaller monkeys are insectivorous it is well at times to give them such insects as are available, like grasshoppers and meal worms, *Tenebrio molitor.*

A Few Common Diseases of Monkeys

Dietary. Acute indigestion is a common disturbance as the result of overfeeding, especially of starchy foods such as cake or candy, or indigestible objects fed by ignorant visitors, as well as excessive amounts of various nuts, such as peanuts. The most common symptom in this case is the presence of "fits." The animal will begin to kick, develop spasms and become semi-comatose. The onset is sudden and the history of feeding is the best guide in arriving at a diagnosis. In cases of chronic "fits" it is important to consider the possibility of brain lesions due to injury about the head from trapezes or from running about the cage when chased by its mates. The presence of parasitic cysts in the brain is also a possible cause.

Diarrhea. Diarrhea is frequently brought on by excessive feeding of oranges, prunes, apples and other laxative foods. It is well to bear in mind that these animals are very nervous and that fright or unusual activity caused by chasing, the presence of strange persons, the presence of other animals like dogs and cats, may bring on a severe attack of diarrhea. In such cases it is obvious that rest and quiet are all that is required for treatment. Symptomatic treatment with bismuth subnitrate in 1 to 2 gr. doses until the feces are darkened by the bismuth may be used.

Cage Paralysis. There is a group of ill-defined conditions classed as "cage paralysis" under which rickets may be placed, the principal symptom being inability to move about. In the case of true rickets in the younger animals the cause is due to a lack in the diet of calcium and phosphates in available combinations, or a deficiency in the antirachitic vitamin "D." If properly fed, the use of ultraviolet irradiation is of some benefit if used under the supervision of a qualified veterinarian. A note of warning should be made here in regard to the use of this new therapeutic aid. Do not expect it to be a cure-all. Rickets may also be treated by the administration of cod liver oil and the use of irradiated (by ultraviolet light) dried milk. Changes in the nervous system have been found in some cases of cage paralysis while in older animals a softening of the bones (osteomalacia) and osteoporosis may be present. In these latter cases no effective treatment is known to the writer and such cases are usually fatal. This group of diseases requires further study.

Parasites. It would be impractical to mention the various parasites, both external and internal, that may be found in monkeys. Various forms of protozoan parasites have been found in the red cells of monkeys, some of them apparently not causing clinical symptoms of disease. Microfilaria may be found in the blood stream of various Central and South American monkeys (sapajous). In one case that the writer autopsied in Colombia, adult filaria were found in the pelvic region of the abdominal cavity and microfilaria in the blood stream. Dr. M. C. Hall classified the adult form as *Filaria gracilis.* Dr. W. Reed Blair has reported the presence of these parasites in South American monkeys at the New York Zoological Park. These parasites apparently do not cause any serious symptoms.

Various strongyli are found infesting the

intestines and are frequently the cause of severe diarrheas and dysenteries. Two general methods of treatment are available. The most effective in the long run, where great numbers of monkeys are kept, as in zoological gardens, is a "dry lot" method. That is the use of wire-bottomed cages whereby absolute cleanliness is maintained, and all fecal matter removed immediately in order to prevent constant reinfestation by contaminating feces and surroundings. Absolute cleanliness and keeping the floors of cages clean is the best general method of controlling the diarrhea brought on by infestation by these parasites. The same applies to the ascaris infestation. Medication using the usual method of treatment may be tried in individual cases.

Infections. Enteritis due to bacterial infection by microorganisms of the paratyphoid group may be found when a mucohemorrhagic intestinal discharge is present. These cases should be discovered while new animals are in quarantine and should be disposed of immediately in order to prevent the infection from spreading. Their bedding should be burned and the cages thoroughly cleaned and disinfected. Treatment is of doubtful value. Cases of amebic dysentery in monkeys have been reported (Eichhorn & Gallagher) and in these cases the same procedure as used for bacillary dysentery should be followed.

Pneumonia. Terminal broncho-pneumonia is a frequent cause of death in older monkeys. The usual treatment of rest, cleanliness and cardiac stimulants may be used.

Tuberculosis. Monkeys kept in private houses in close contact with human beings frequently suffer from pulmonary and miliary tuberculosis, apparently becoming infected from human sources. Cases at this Park are rare, only three cases having been found at autopsy during the past four years. All monkeys that die are examined for evidence of tuberculosis at the Park. The writer has seen an outbreak of miliary tuberculosis in a laboratory where five *Macacus rhesus* monkeys were kept, all of which died from generalized tuberculosis. If for no other reason, the keeping of monkeys as pets should not be encouraged unless they can be cared for properly. From a humane and sanitary point of view it would be best to keep them in zoologcial gardens.

DIVERTICULUM OF THE ESOPHAGUS DUE TO CONGENITAL MALFORMATION

The patient was a four-months-old black and white mongrel in a very emaciated condition brought to us Oct. 8, 1928.

The owner stated that this animal had never been right since she had owned it, approximately five or six weeks. It had always had a good appetite and would eat raveneously but vomit the food within a few minutes. It could, however, retain liquids better than solids but these were sometimes returned.

Examination. This was practically negative. The animal was extremely emaciated and rachitic but relatively active and did not appear sick. The temperature, pulse, and respirations were normal with the exception of a slight rattling in the upper air passages. The dog vomited while the examination was proceeding and was hungry enough to again swallow the vomited material. Fecal examination was negative.

Diagnosis. An obstruction deep in the esophagus, probably a smooth body of some sort from the length of time the trouble had lasted. A probang was passed into the stomach without any great difficulty, but to our surprise no obstruction could be located. This balled up our diagnosis and the animal was kept under observation without any treatment. During this period of observation it acted about as had been described by the owner but became gradually worse in condition and died Oct. 16.

Autopsy. A diverticulum of the esophagus was found just anterior to a constriction of the esophagus caused by the position of the ductus arteriosus over instead of under the esophagus as it should have been. In other words the constriction was formed by the ductus arteriosus above and the pulmonary artery and aorta below the esophagus. The lungs appeared smaller than usual but this was attributed to the amount of thoracic

space taken up by the diverticulum. There was also a little pneumonia. This may have been due to inhalation of vomited material as no doubt the wheezing also was due.

Comment

This case is reported because it gives a good clinical picture of some obstruction in the lower (thoracic) part of the esophagus whatever may be the cause. An apparently well and hungry dog that eats, swallows and then almost immediately vomits the food always suggests a deep obstruction. It is differentiated from gastritis in that the dog

is not sick (except in case of wounding by sharp foreign bodies) is often ravenously hungry, not dainty or disgusted with food as the nauseated animal is; eats and then vomits almost immediately, can often retain liquids but not solids, and does not vomit or appear sick after the food has been thrown off. In this case our diagnosis or suspicions of obstruction were correct even after we were disappointed with the probang. The animal was valueless and an X-ray was not made but this would have been useless unless the animal had been fed a barium or bismuth meal previous to making the picture.

Ithaca, N. Y. H. J. Milks,
A. Gow, '29
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TUMEFIED ORBITAL GLAND

The orbital gland is a small structure situated on the inside of the membrana nictitans. Normally it is not seen but frequently through injury or inflammation it becomes displaced, appearing as a red tumor in the inner canthus of the eye. (See illustration.)

Some state that if the condition is seen early, the swelling may be reduced by the application of astringents so that the gland may be replaced and retained in position. In our experience this treatment has not been successful and it has been necessary to remove the gland.

Operation. Irrigate the eye with a weak boric acid or other antiseptic solution. After this anesthetize with a solution of cocain or butyn to which a few drops of adrenalin chlorid has been added. After waiting a few minutes for the anesthetic to act, with an assistant steadying the dog's head, grasp the tumor with small forceps, pull away from attachments and snip off with scissors as near the membrana nictitans as possible. Hemorrhage is ordinarily of no consequence and is easily controlled by hot wet antiseptic packs. No after treatment is required although a mild wash or ointment will do no harm.

The third lid is removed in much the same way but in this case it is necesasry to get the anesthetic behind the lid for good results. The third lid is then pulled out with forceps and cut off close to its attachments with scissors. Hemorrhage is rarely of importance but in some animals is severe. We have had a few cases in which it was necessary to ligate the bleeding vessels in order to control it.

Ithaca, N. Y. H. J. Milks.